

# **National Weather Service**

## **Storm Spotter Training**

**Kelly Godsey**

**Forecaster**

**NWS-Tallahassee**



# Presentation Topics

- ◆ National Weather Service overview, mission, and products
- ◆ Basic Storm Definitions
- ◆ What to report and what makes a good report
- ◆ Severe weather climatology
- ◆ Thunderstorm components common to the Southeast
- ◆ Tornado Look alike
- ◆ A case study on severe weather, March 1, 2007
- ◆ Threat Assessment
- ◆ Weather Safety



# **Your National Weather Service**

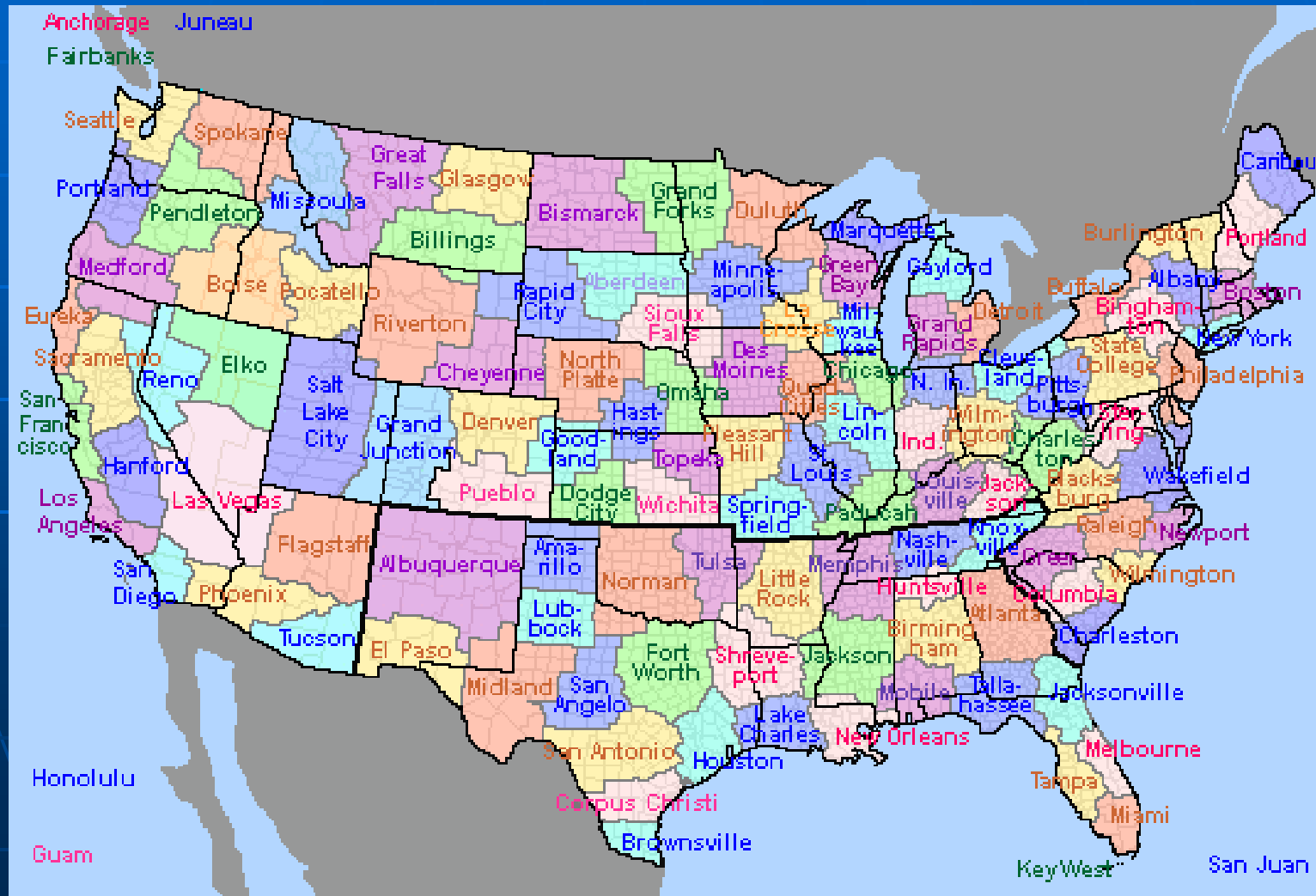
**The National Weather Service (NWS) is part of the National Oceanic & Atmospheric Administration (NOAA), which is within the Department of Commerce.**

**Our mission: The NWS provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which is used by other governmental agencies, the private sector, the public, and the global community.**

**[www.noaa.gov](http://www.noaa.gov)**

# [www.weather.gov](http://www.weather.gov)

Your source for official weather information  
123 offices serving America & surrounding territories



National Weather Service county warning areas



# Sources of Weather Information

- **NOAA Weather Radio** - Your fastest link to vital information 24 hours/day
  - [www.weather.gov/nwr](http://www.weather.gov/nwr)
- **The Internet** - Your official source for reliable and accurate weather information
  - [www.weather.gov](http://www.weather.gov)
- **EMWIN** - Emergency Management Weather Information Network
  - A suite of data access methods which make available a live stream of weather and other critical emergency information
  - <http://iwin.nws.noaa.gov/emwin/index.html>
- **Commercial or cable television** – You can tune to your local or cable TV station to receive National Weather Service watches/warnings/advisories
- **Commercial radio** – LP1 stations broadcast all tornado, severe thunderstorm, and flash flood warnings.



## National Weather Service Forecast Office

### Tallahassee, FL

www.weather.gov



TAE Home

SRH Home

Organization

Search

Enter Search Here

Go

Local weather  
forecast by  
"City, St" or zip code

City, St

Go

#### Current Hazards

Local  
Graphical  
National  
Storm Reports  
Past Events

#### Current Conditions

Observations  
Florida Weather  
Georgia Weather  
Alabama Weather  
Satellite Images  
Rivers & Lakes AHPS  
Precip Estimate  
Hydrology  
Drought Monitor  
Marine (Buoys)

#### Radar Imagery

Local Page  
Tallahassee, FL  
Eglin AFB, FL  
Fort Rucker, AL  
Moody AFB, GA  
Nationwide

#### Forecasts

Activity Planner  
Public Forecasts  
Aviation  
Marine  
Fire Weather  
Local Discussion

#### Climate

Local  
National  
More...

#### Tropical Weather

N FL Tropics Watch  
Hurricane Center

#### Top News of the Day: (Other Local News)

- El Niño and its Effect on the Southeast U.S.
- AWARD: SOO Irv Watson, 40 Years Federal Service
- El Niño expected to continue through early 2010.
- Sept. Climate: Narrative Summary, Tabular Summary, F6.



#### Point Forecast Interactive Map (What is this?)

Map Help

Click on the map below for the latest forecast.

En Español



Read watches,  
warnings &  
advisories.

Zoom  
Out

Severe Thunderstorm  
Watch  
Hazardous Weather  
Outlook  
Short Term Forecast

Last map update: Fri, Oct. 9, 2009 at 8:00:01 pm EDT



Hazards



Tropics



Radar



Satellite



Forecast



Marine



Climate



Cell Phone



Skywarn

#### QUICK PRODUCT SELECTOR

Hourly Weather Observations



Retrieve Product

County Forecasts



Get the Forecast!

# Your Official Weather Source

National Weather Service • Since 1870

www.srh.noaa.gov/tlh





Your National Weather Service forecast

## Thomasville GA



Enter Your "City, ST" or zip code

Go

NWS Tallahassee, FL

Point Forecast: Thomasville GA

30.84°N 83.98°W (Elev. 272 ft)

Mobile Weather Information | En Español

Last Update: 4:07 pm EDT Oct 9, 2009

Forecast Valid: 8pm EDT Oct 9, 2009-6pm EDT Oct 16, 2009

### Forecast at a Glance

Tonight	Saturday	Saturday Night	Sunday	Sunday Night	Columbus Day	Monday Night	Tuesday	Tuesday Night
								
Partly Cloudy Lo 73 °F	Chance Tstms Hi 89 °F	Chance Tstms Lo 69 °F	Chance Tstms Hi 85 °F	Chance Tstms Lo 68 °F	Chance Tstms Hi 88 °F	Slight Chc Tstms Lo 67 °F	Chance Tstms Hi 87 °F	Chance Tstms Lo 67 °F

### Detailed 7-day Forecast

Hazardous weather condition(s):

#### [Hazardous Weather Outlook](#)

**Tonight:** Partly cloudy, with a low around 73. South wind around 5 mph.

**Saturday:** A 50 percent chance of showers and thunderstorms. Patchy fog before 10am. Otherwise, mostly cloudy, with a high near 89. South southwest wind between 5 and 10 mph. New rainfall amounts between a tenth and quarter of an inch, except higher amounts possible in thunderstorms.

**Saturday Night:** A 30 percent chance of showers and thunderstorms, mainly after 2am. Mostly cloudy, with a low around 69. Calm wind.

**Sunday:** A 50 percent chance of showers and thunderstorms. Mostly cloudy, with a high near 85. Calm wind becoming north northwest around 5 mph.

**Sunday Night:** A 30 percent chance of showers and thunderstorms. Mostly cloudy, with a low around 68. East northeast wind around 5 mph.

### Current Conditions

[Move Down]

Moultrie Municipal Airport

Lat: 31.09 Lon: -83.8 Elev: 295

Last Update on Oct 9, 7:40 pm EDT

Fair

84 °F  
(29 °C)

Humidity:	70 %
Wind Speed:	S 8 MPH
Barometer:	29.96"
Dewpoint:	73 °F (23 °C)
Heat Index:	91 °F (33 °C)
Visibility:	10.00 mi.
More Local Wx:	3 Day History:

### Radar and Satellite Images



### Detailed Point Forecast

[Move Up]

## County Specific Information:

## \* Hazardous Weather Outlook

## \* Watches

## \* Warnings

## \* Severe Weather Statements

## \* Short Term Forecasts

# NOAA ALL Hazards Weather Radio

<http://www.srh.noaa.gov/tae/nwr.php>

Broadcasts are found in the public service band at these seven broadcast frequencies (MHz):

162.400	162.425	162.450	162.475	162.500	162.525	162.550
MHz	MHz	MHz	MHz	MHz	MHz	MHz





# Products

Look for these useful NWS products during severe weather:

**Hazardous Weather Outlook** – summary of potential hazardous weather threats for the next seven days. Graphical version available!

**Zone Forecast** – a general seven day forecast for your specific county

**Point and Click Forecast** – a point specific forecast for your community

**Short Term Forecast** – a forecast for up to six hours in advance providing greater detail of significant weather features in your area

**Watch** – a statement detailing potential development of severe weather

**Warning** – product detailing specific severe weather threats on a county level

**Severe Weather Statement** – a follow-up statement to a previous warning which contains additional updated information

**WSR-88D Products** – Radar imagery and loops with warning overlay

# Important Definitions

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- **Watch** – Atmospheric conditions are favorable (or could become favorable) for the development of thunderstorms which could produce severe weather – remain alert.
- **Warning** – Severe weather has occurred or is likely to occur – take protective action.



# Tornado Warning Criteria

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**A tornado is occurring, a verified funnel cloud is reported and the NWS believes it could develop on the ground, or radar indicates a thunderstorm capable of producing a tornado.**



# Severe Thunderstorm Criteria

wind 58 mph or greater



3/4 inch or larger hail\*

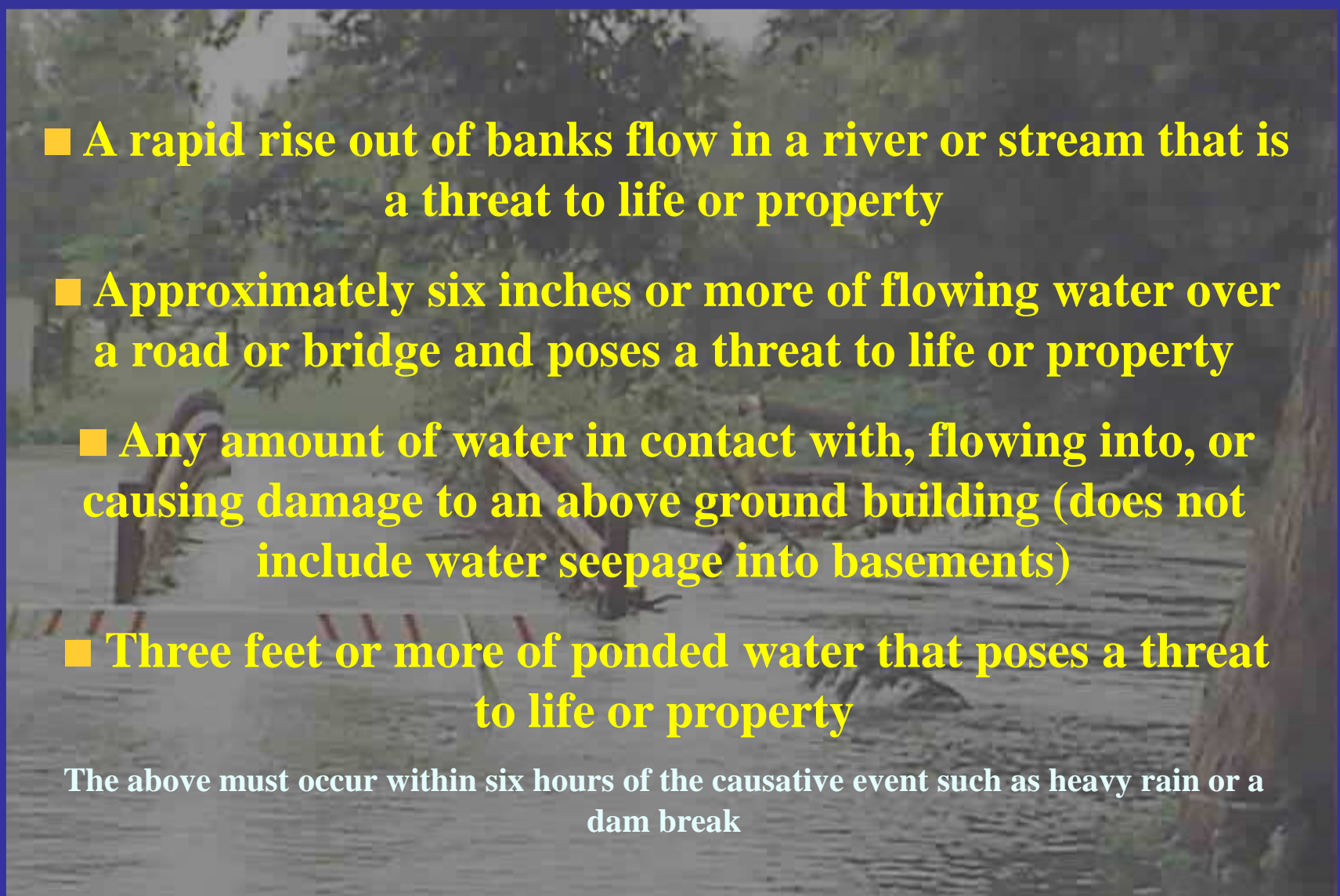


**On January 1, 2010, severe thunderstorm hail criteria will increase to 1 inch**



# Flash Flood Warning Criteria

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- 
- A photograph of a flooded road. A car is partially submerged in the water, with only its roof and the tops of its windows visible. The water is murky and appears to be flowing rapidly. In the background, there are trees and a bridge structure. The overall scene depicts a dangerous flash flood situation.
- A rapid rise out of banks flow in a river or stream that is a threat to life or property
  - Approximately six inches or more of flowing water over a road or bridge and poses a threat to life or property
  - Any amount of water in contact with, flowing into, or causing damage to an above ground building (does not include water seepage into basements)
  - Three feet or more of ponded water that poses a threat to life or property

The above must occur within six hours of the causative event such as heavy rain or a dam break

# The Effective Spotter Report





# The Effective Spotter Report

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- Call your NWS office via phone 800-598-4562 or 850-942-8833
- State source of report (your identity, i.e. trained spotter)
- Give your exact location (and location relative to the event)
- State the start & end time of the event (be sure to differentiate between event time & report time)
- Give an event description (be as specific and detailed as possible)
- If event is still occurring, provide frequent updates
- Give as reliable information as possible. Do not embellish

# Spotter Groups

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- County Emergency Management – Law enforcement, fire departments, trained volunteers
- NWS Skywarn Spotters – [www.skywarn.org](http://www.skywarn.org)
- Amateur Radio - [www.arrl.org](http://www.arrl.org)
- Others – media, surface observations, storm chasers

Your storm report  
can also be sent to  
the NWS via the  
Internet.





- Enter your storm report information and submit it directly to NWS forecasters!

Severe Weather Report Form		
<a href="#">Click Here for the Winter Weather Report Form</a>		
Date & Time		
Date	Time	<input type="radio"/> Estimated
Oct / 09 / 2009	19 : 17 EST	<input type="radio"/> Exact
Location		
Select County, State	City/Town	
Leon, FL (073)	Tallahassee	
Weather		
<input type="checkbox"/> Tornado		
<input type="checkbox"/> Funnel Cloud		
<input type="checkbox"/> Wall Cloud	* Note if there is rotation in narrative.	
<input type="checkbox"/> Hail	Size:	
<input type="checkbox"/> High Wind	Wind Speed:	<input type="radio"/> Measured
	MPH	<input type="radio"/> Estimated
<input type="checkbox"/> Flood		
<input type="checkbox"/> Flash Flood		
<input type="checkbox"/> Other		
Damage, Injuries, Narrative		
Any Damage?	<input type="radio"/> Yes	<input type="radio"/> No
Was Anyone Hurt?	<input type="radio"/> Yes	<input type="radio"/> No
Please describe what you observed, movement and any associated damage, including injuries, 2500 characters maximum:		
<div></div>		
<div>Submit Report</div> <div>Reset</div>		

# Estimating Wind Speed

## THE "SET" EFFECT.....

Storm spotters must also keep in mind that during a severe weather event, Stress, Excitement, and Tension levels are running high. This is called the "SET" effect, and it can alter your logic and reasoning abilities. Because of its presence, it is often very easy to over-estimate wind speeds.

A wind gust of 40 MPH during a fair weather day will not cause any great concern, but this same wind speed when experienced during a thunderstorm may seem like 60 MPH gust because of the SET effect.

When in doubt about your estimate, re-think it and try to remain calm and objective as possible. Use the table in the previous slide as a guide. Your goal is to pass real time observations with accuracy, speed, and professionalism.

# Estimating Wind Speed

25-31 mph - large branches in motion

32-38 mph – whole trees in motion

39-54 mph – twigs break off, wind impedes walking

55-72 mph – damage to chimneys and TV antennas, large branches broken and some trees uprooted

73-112 mph – removes shingles, windows broken, trailer houses overturned, trees uprooted

113+ mph – roofs torn off, weak buildings and trailer houses destroyed, large trees uprooted



Copyright Mike Umscheid



# What To Report

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## Tornado, Funnel Cloud, or Wall Cloud



Copyright Eric O'Connor

# What To Report

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## Strong or Damaging Wind



# What To Report

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## Hail





# What To Report



Copyright Simon Brewer



Copyright Greg Woods



# What To Report

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## Any Storm Damage



# What To Report

## Urban Flooding





# What To Report

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## Rural Flooding



Copyright Joel LaRue

# What To Report

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## Heavy Rain or High Water





# What To Report

## Past Water/Flood Damage



Courtesy of Debbi Segina



# What Makes a Good Report?

Caller #1: "I was just calling to report that a severe thunderstorm just moved through my neighborhood. It was windy and there was lots of lightning and heavy rain."

Caller #2: "We just had a severe thunderstorm move through our neighborhood in Thomasville. We have several large trees down in the road and I also see quarter size hail on the ground."

One of these reports is better than the other. Why?

# What Makes a Good Report?

Caller #1: "I was looking out my window toward the south and I saw a tornado. The clouds were really dark and hanging near the ground."

Caller #2: "We definitely had a funnel cloud move overhead. You could see the cloud base rotating with a funnel extending down. It wasn't on the ground yet. I lost sight of it a few minutes ago."

One of these reports is better than the other. Why?

# What Makes a Good Report?

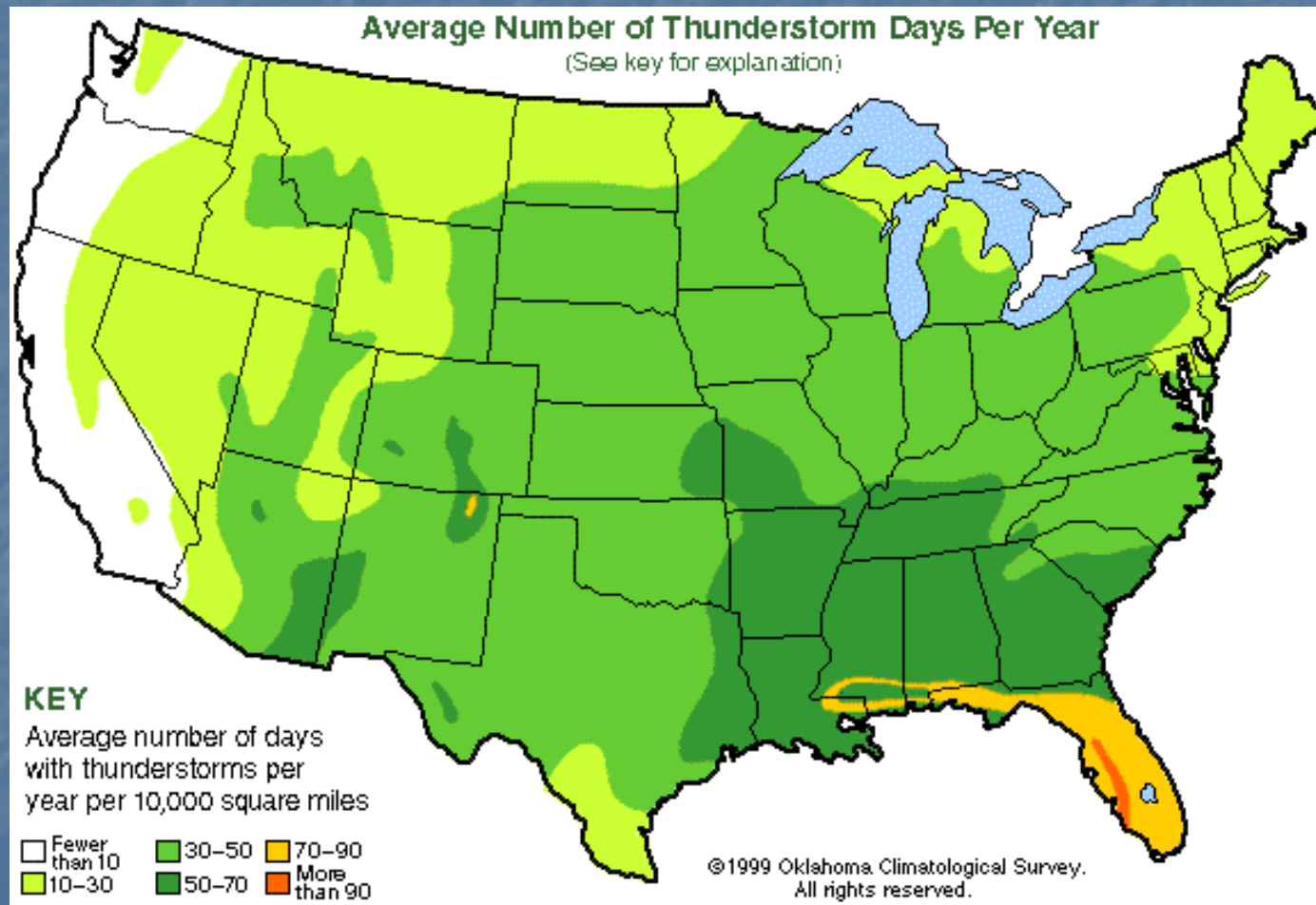
Caller #1: "I live in Quitman and there was quarter size hail falling downtown. A large oak tree also fell. There was very heavy rain for about 20 minutes, but I haven't seen any flooding in town."

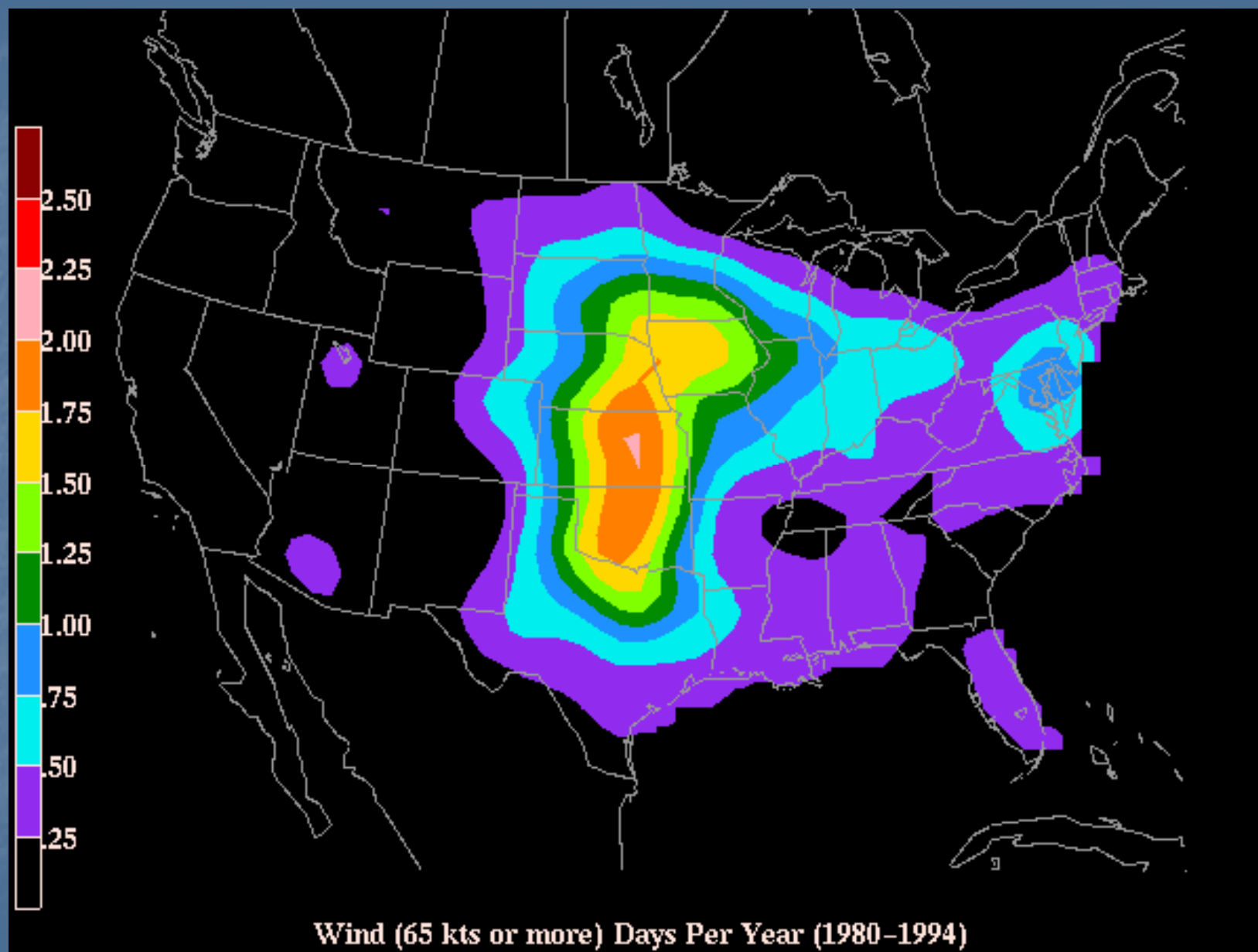
Caller #2: "I tell you what. If you don't have a warning out, you are crazy. That storm was terrible. The rain was just pounding on my window and it didn't stop lightning for like five minutes."

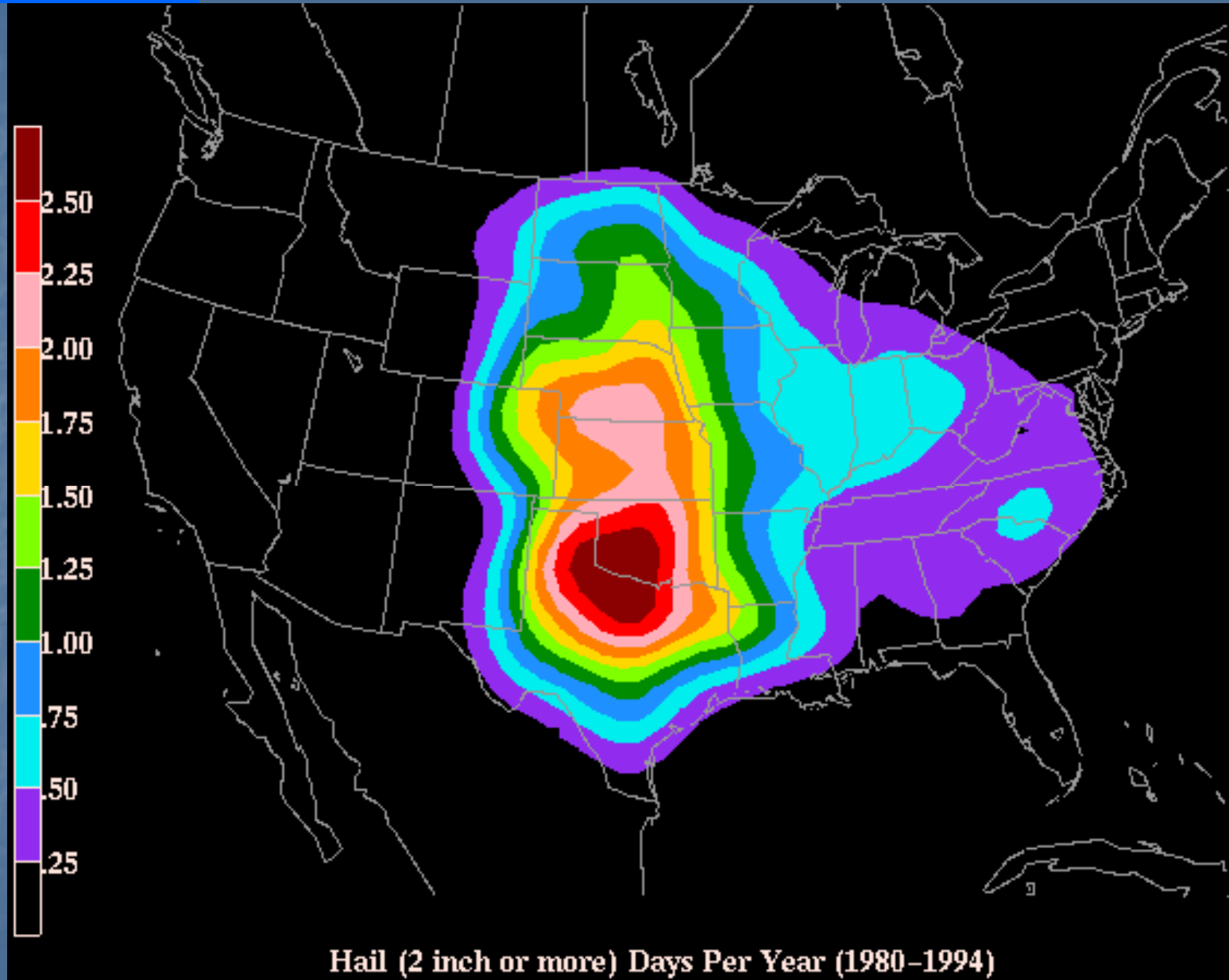
One of these reports is better than the other. Why?



# Thunderstorm Climatology

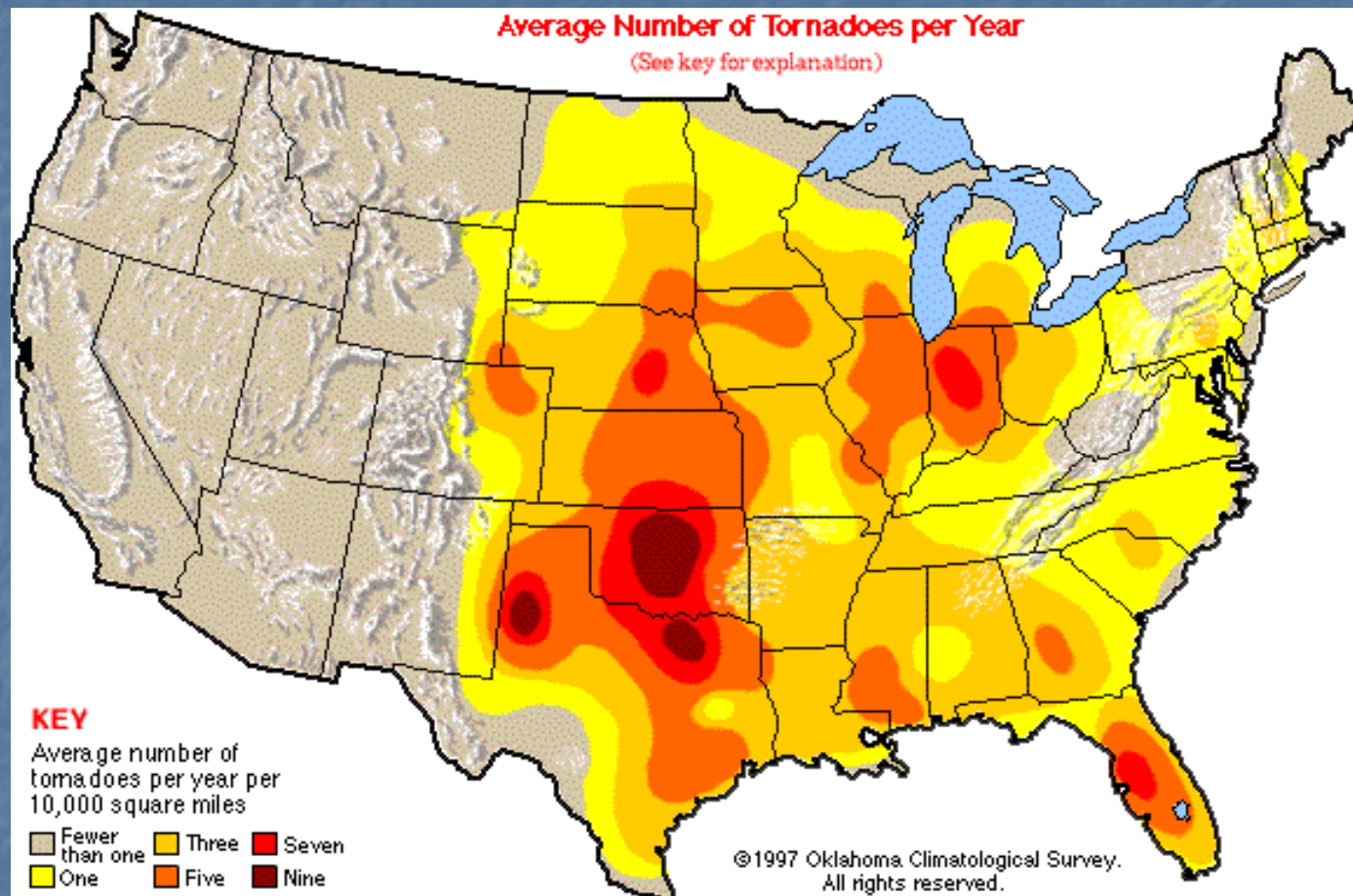








# Tornado Alley



Oklahoma Climatological Survey <http://www.ocs.ou.edu>

# Severe Weather Forecasting

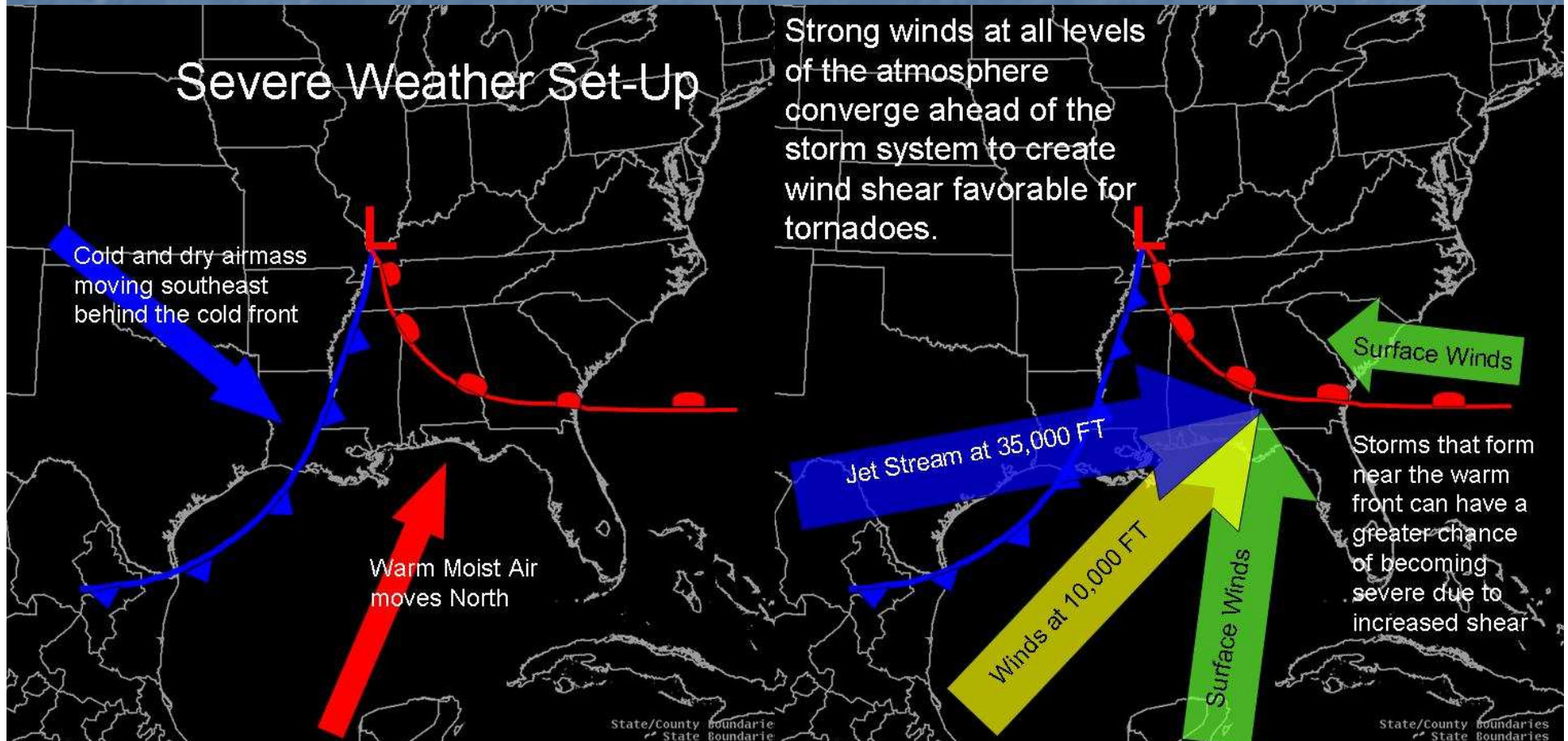
- When forecasting severe weather, we need four main ingredients to come together
  - Instability (lots of warm air at the surface)
  - Moisture (southerly winds off the Gulf)
  - Lifting mechanism (strong cold front)
  - Wind shear (winds increasing and changing direction)
- Only on rare occasions do all four of these ingredients mix together at the same time in our region.

# The ingredients begin to take shape...

## Lift, Instability and Moisture

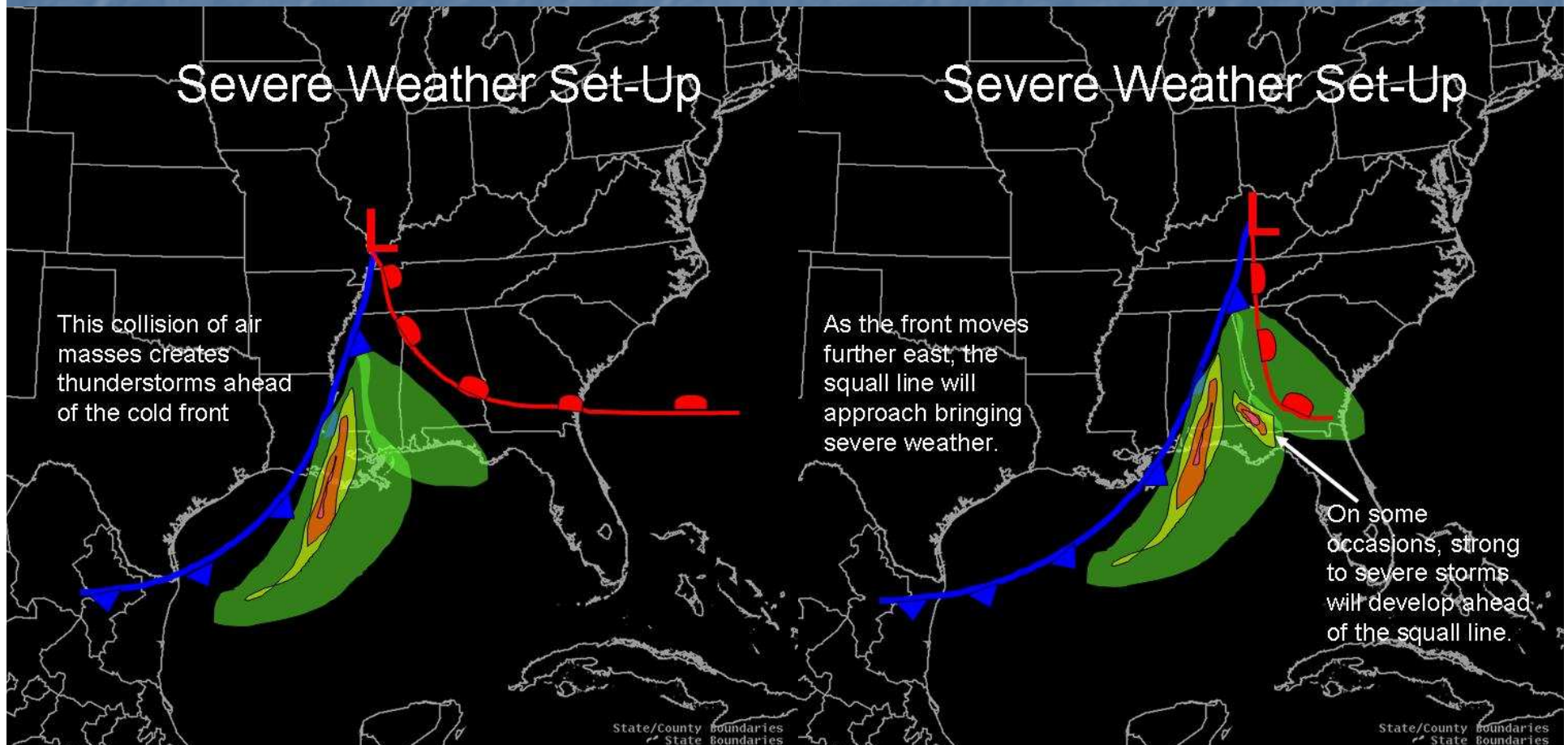
## Wind Shear

### Severe Weather Set-Up

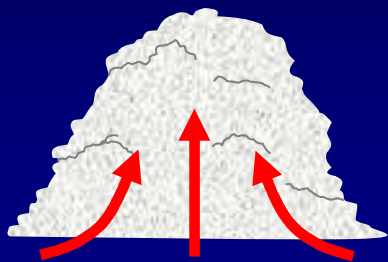




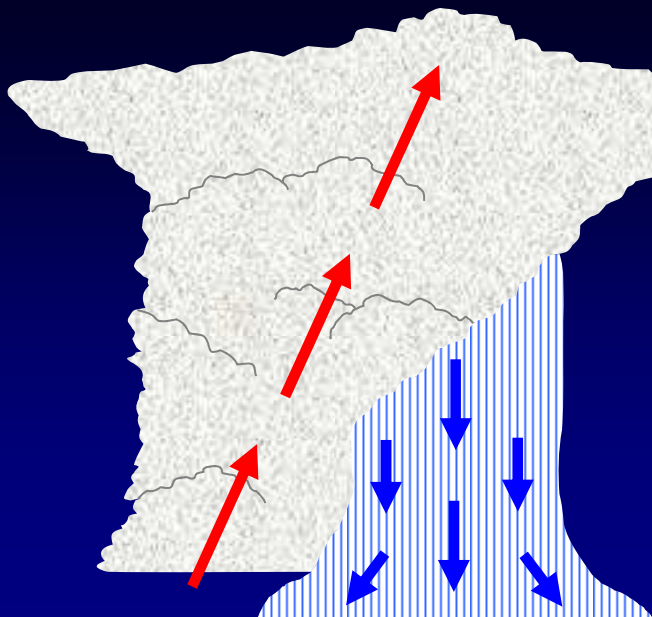
This is what it looks like when the ingredients have come together



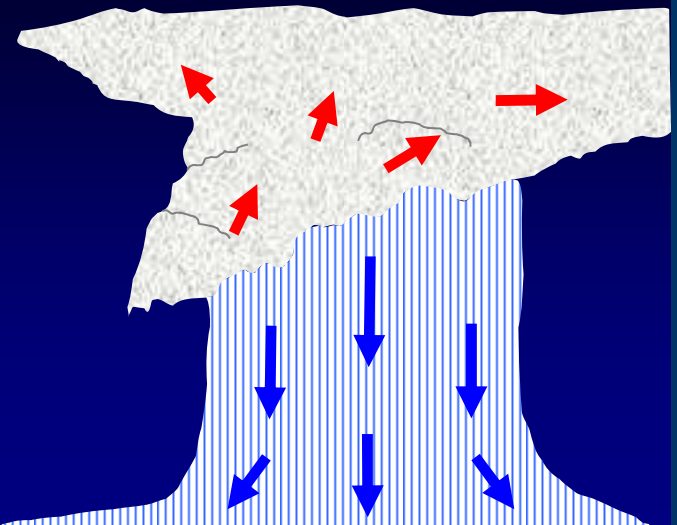
# Thunderstorm Life Cycle



Cumulus Stage



Mature Stage



Dissipating Stage



# Common Thunderstorm Types

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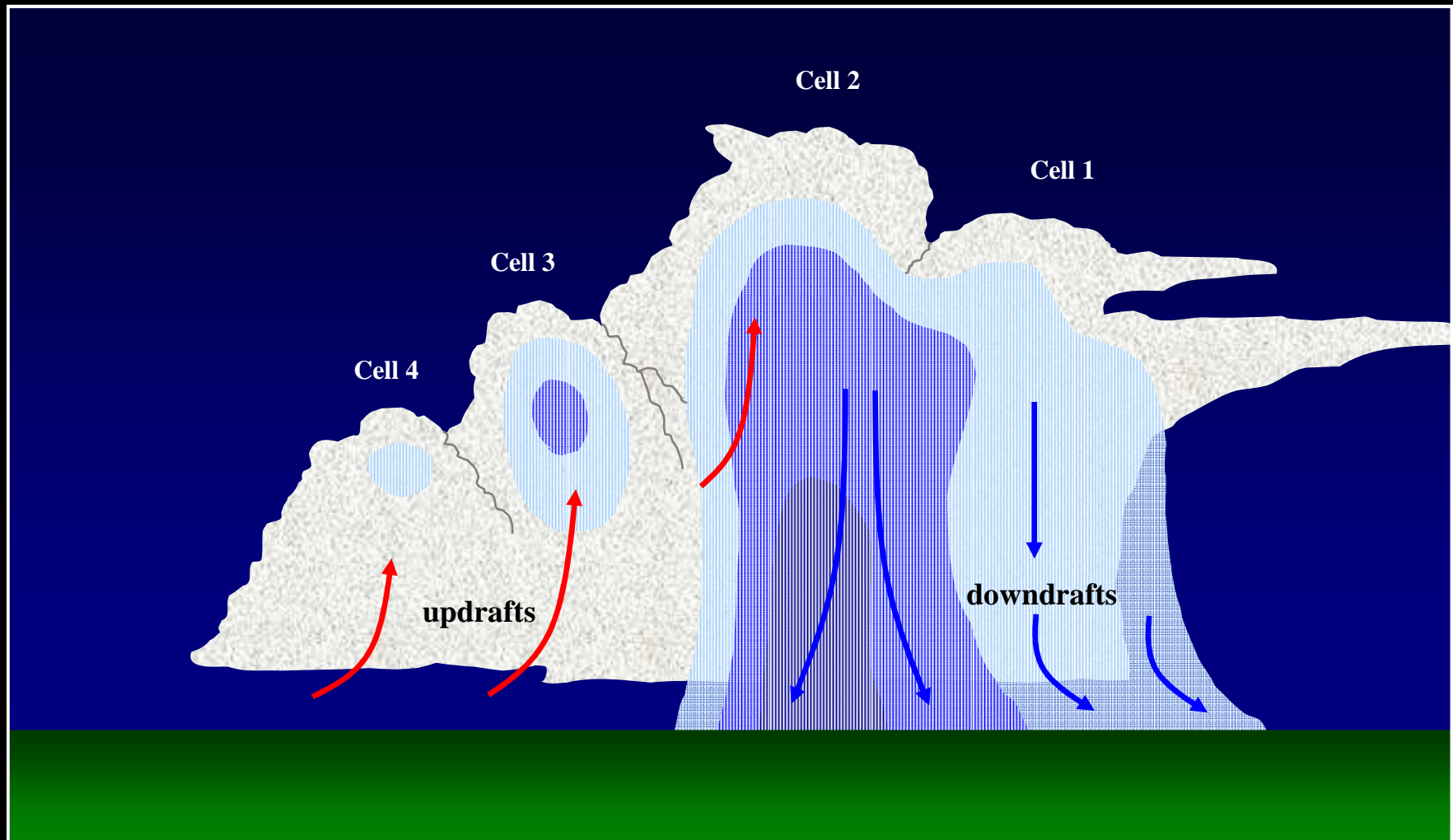
- **Multicell** - ordinary storms with low severe threat
- **Squall line** - line of storms with moderate wind threat
- **Classic Supercell** - rotating updraft with high severe threat
- **HP (high precipitation) Supercell** - rotating updraft often times obscured by heavy rain, high severe threat



Copyright Bob Henson



# Multicell Thunderstorm



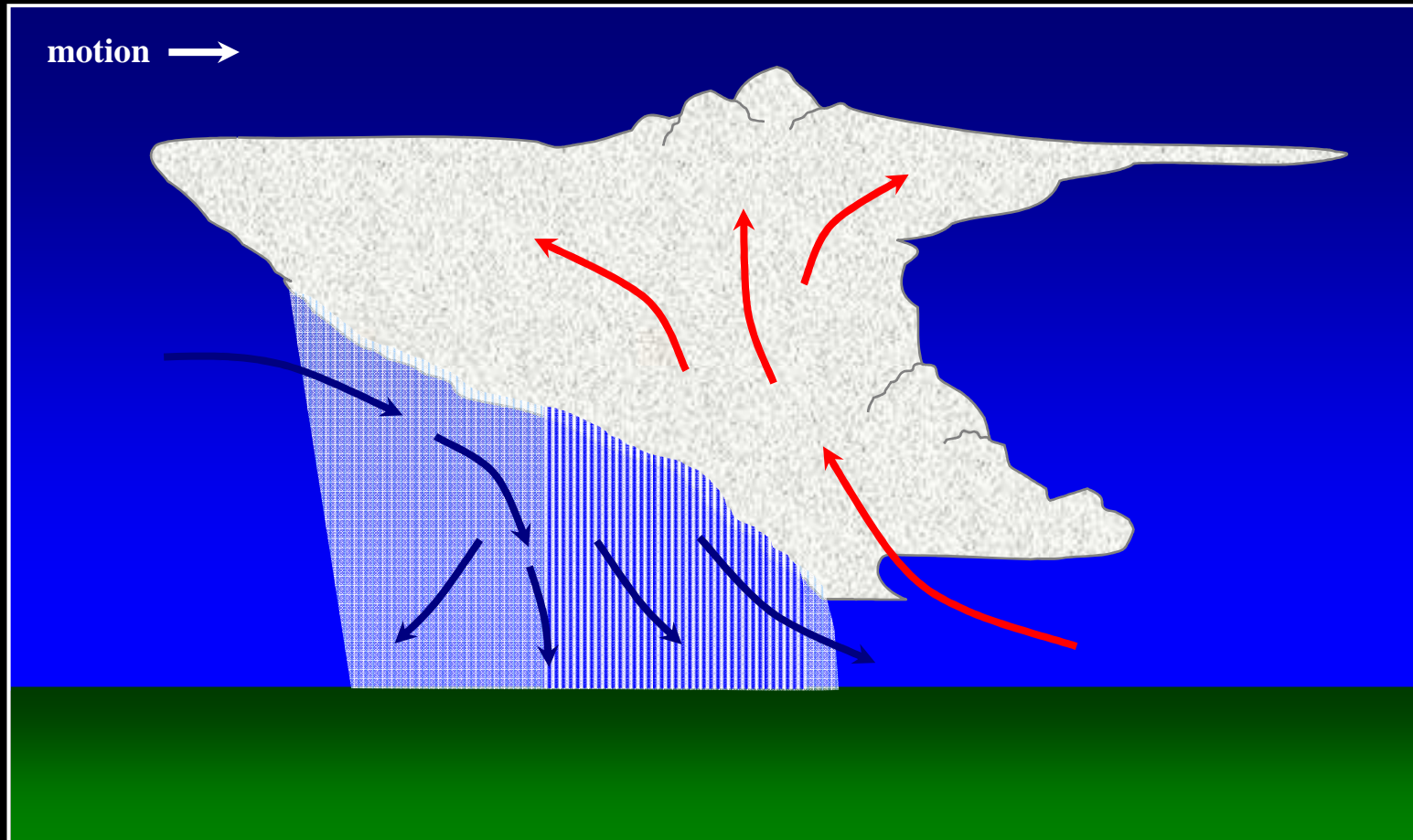
Side view

# Multicell Thunderstorm



Copyright Alan Switzer

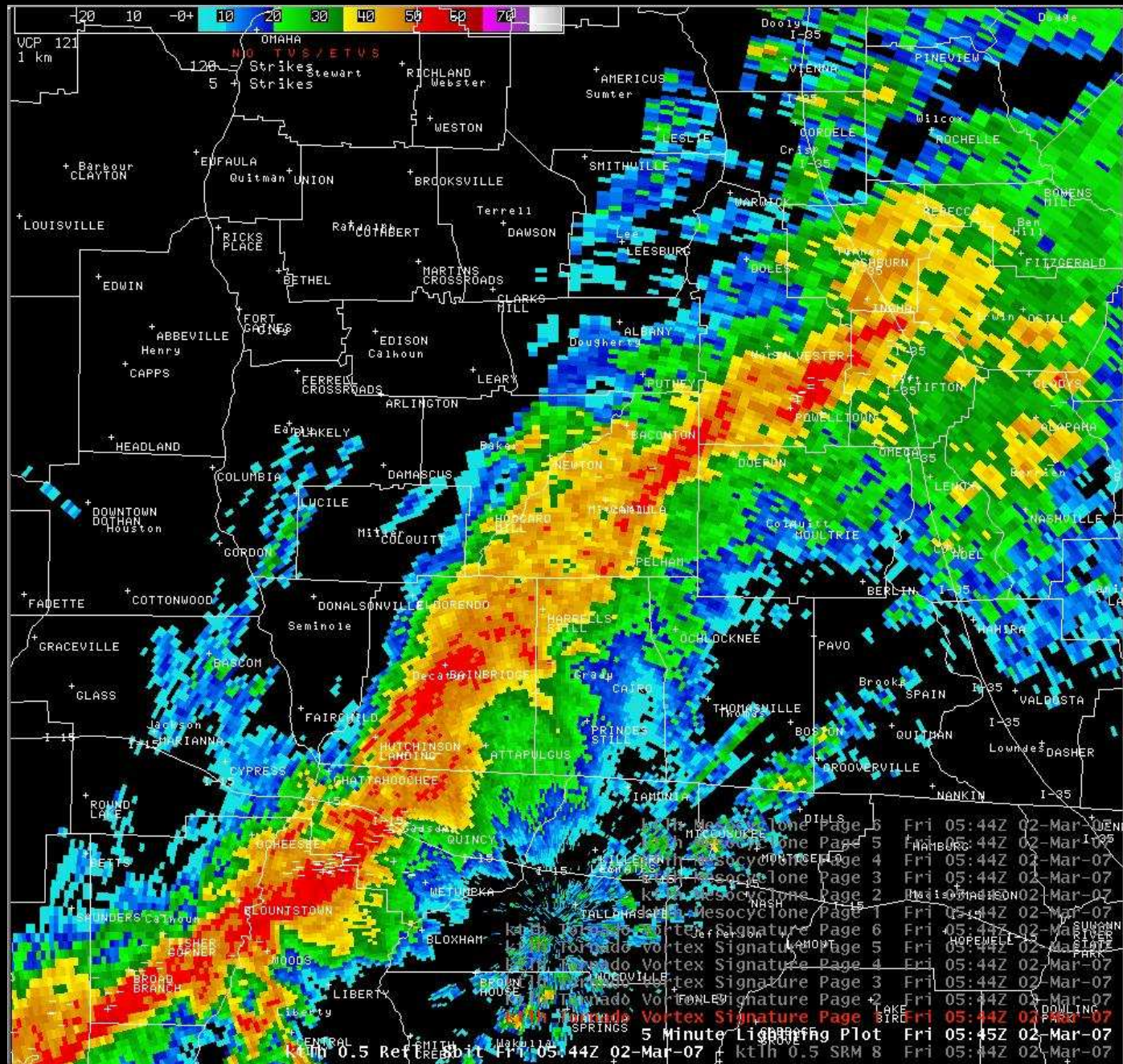
# Squall Line



(Cross section)



# Squall Line

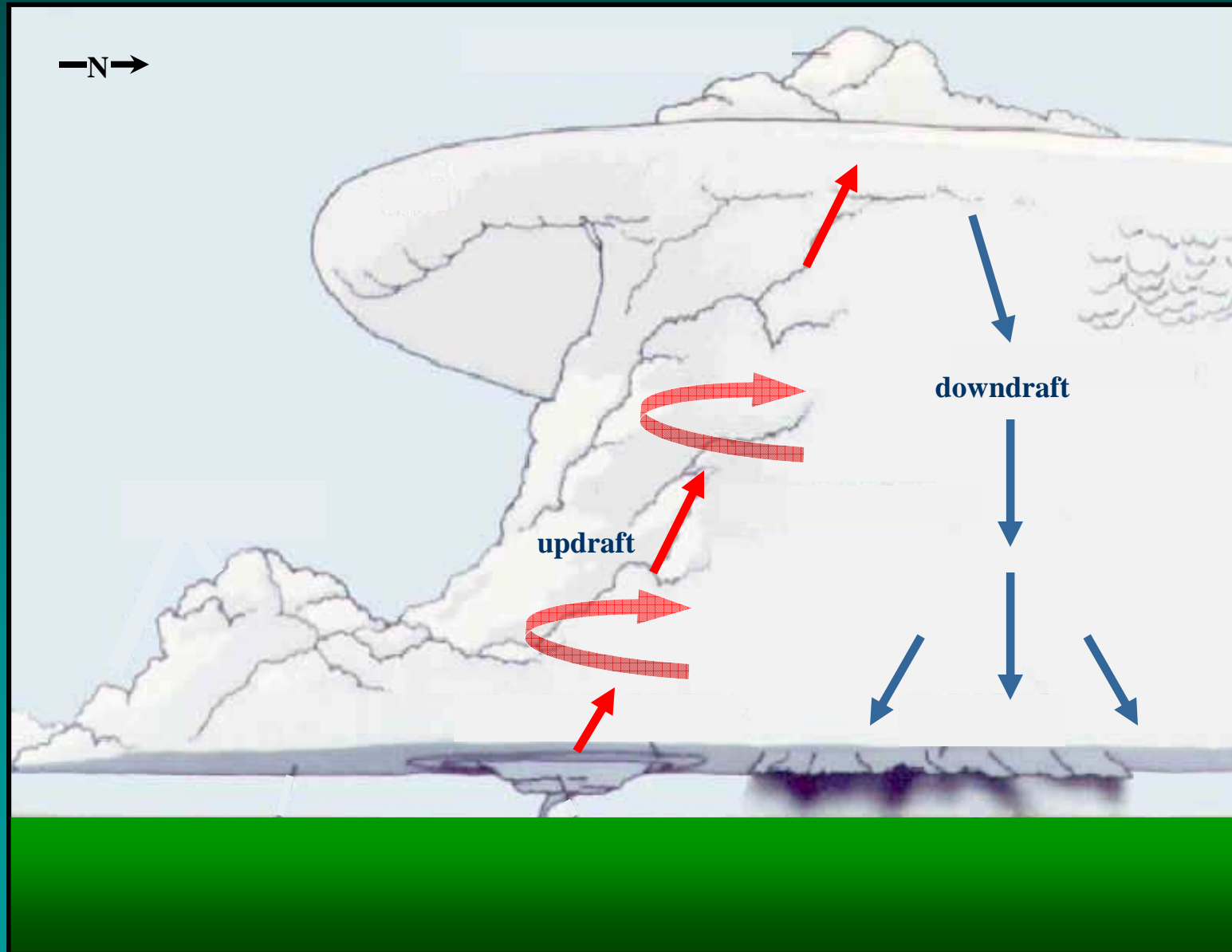


# Squall Line



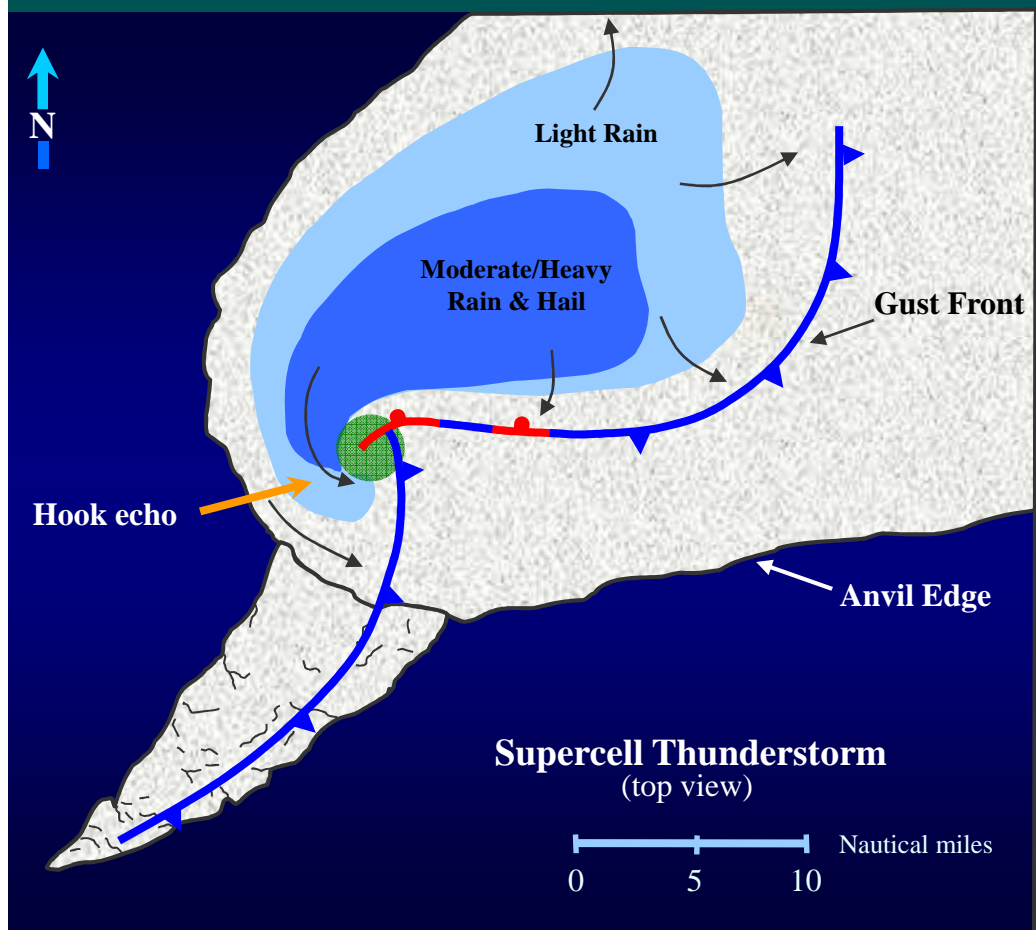
Copyright Jim Bishop

# Classic Supercell Thunderstorm





# Classic Supercell Thunderstorm



### WSR-88D Radar Image



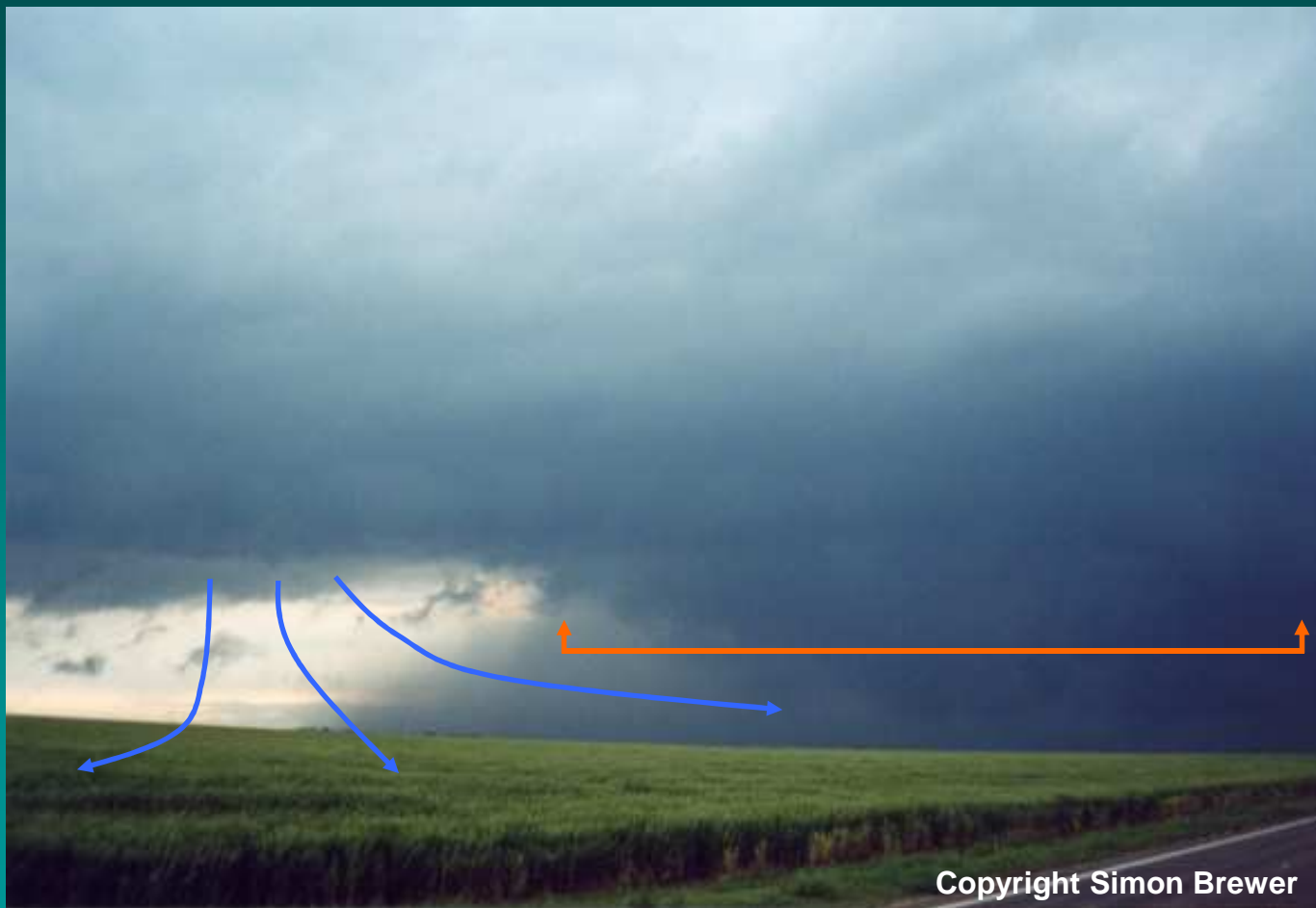




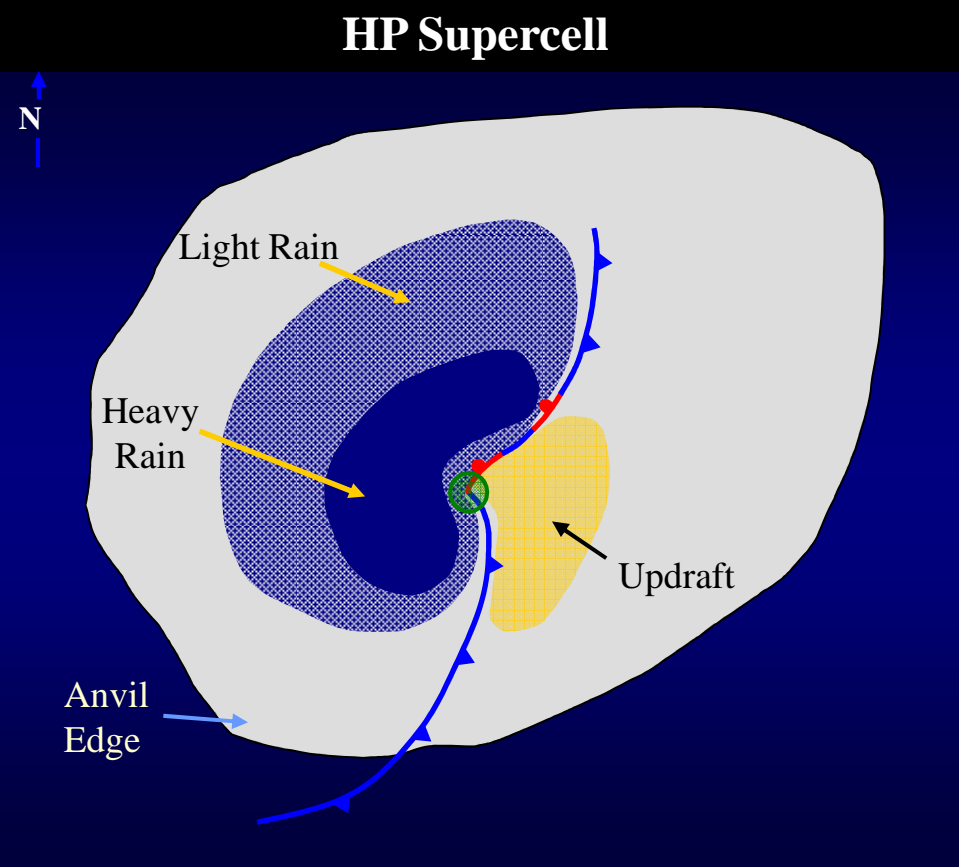
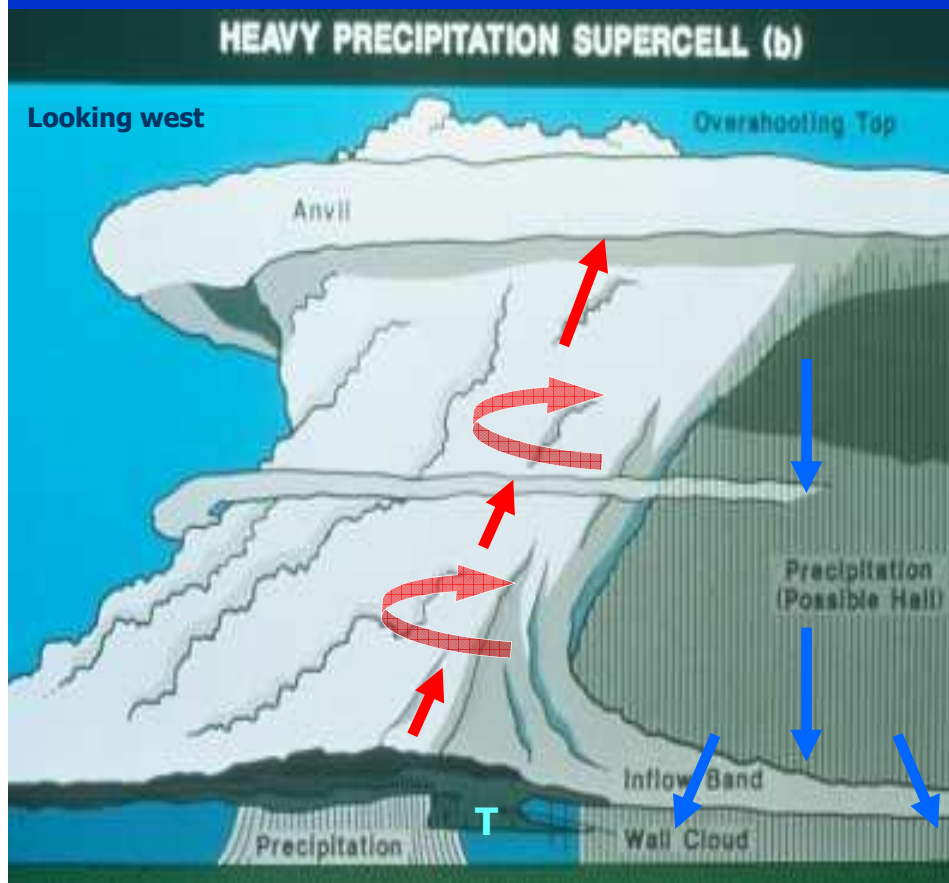




# Rear Flank Downdraft



# HP Supercell



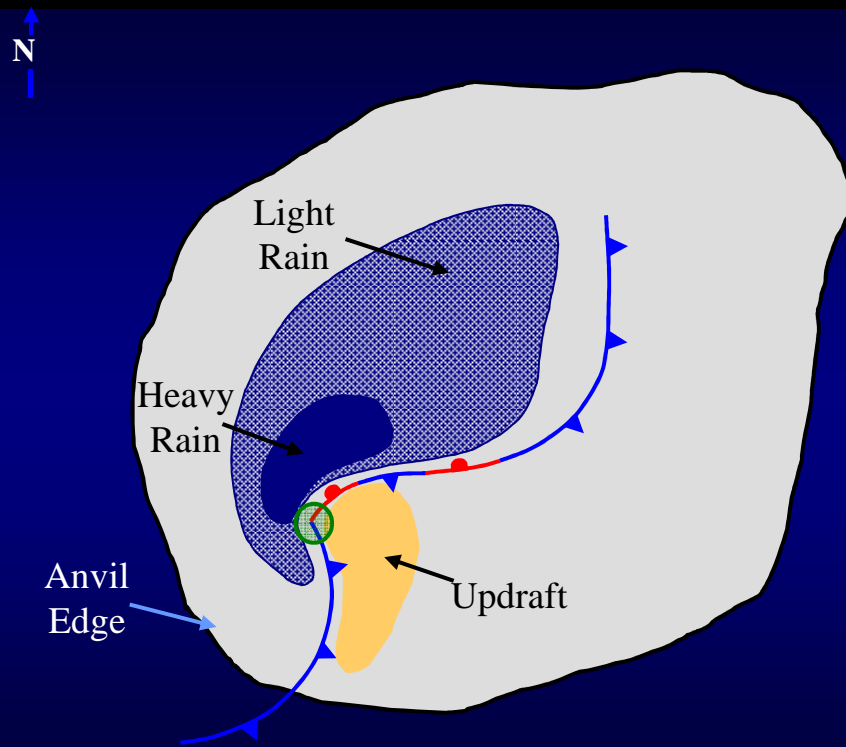
# HP Supercell





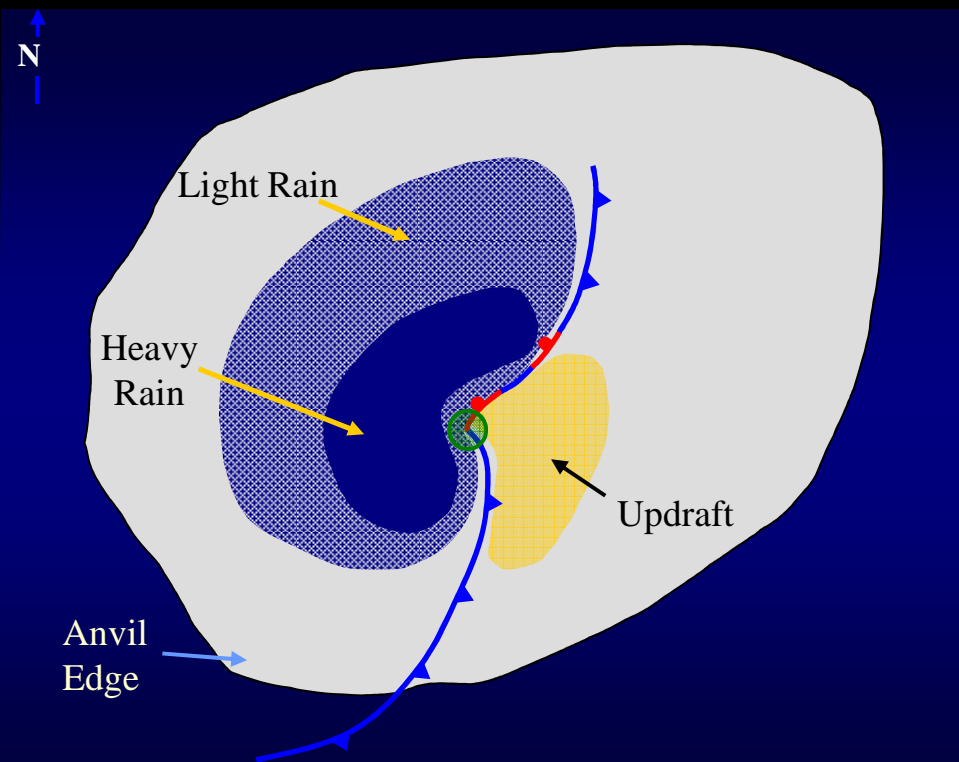
# Classic vs. HP comparison

**Classic Supercell**



**Top view**

**HP Supercell**



**Top view**

## Two Supercell Thunderstorms from the March 1-2, 2007 Tornado Outbreak



Classical Supercell



High Precipitation  
Supercell

# HP Supercell



Copyright Jon Davies



# HP Supercell



Copyright Matt Grzych

**Updrafts**

**Downdrafts**

**Shelf Cloud**

**Wall Cloud**

**Funnel Cloud**



Copyright Ian Wittmeyer

**Rainfree Base**

**Land spout**

**Gust Front**

**Tornado**

**Gustnado**

# Updraft Characteristics



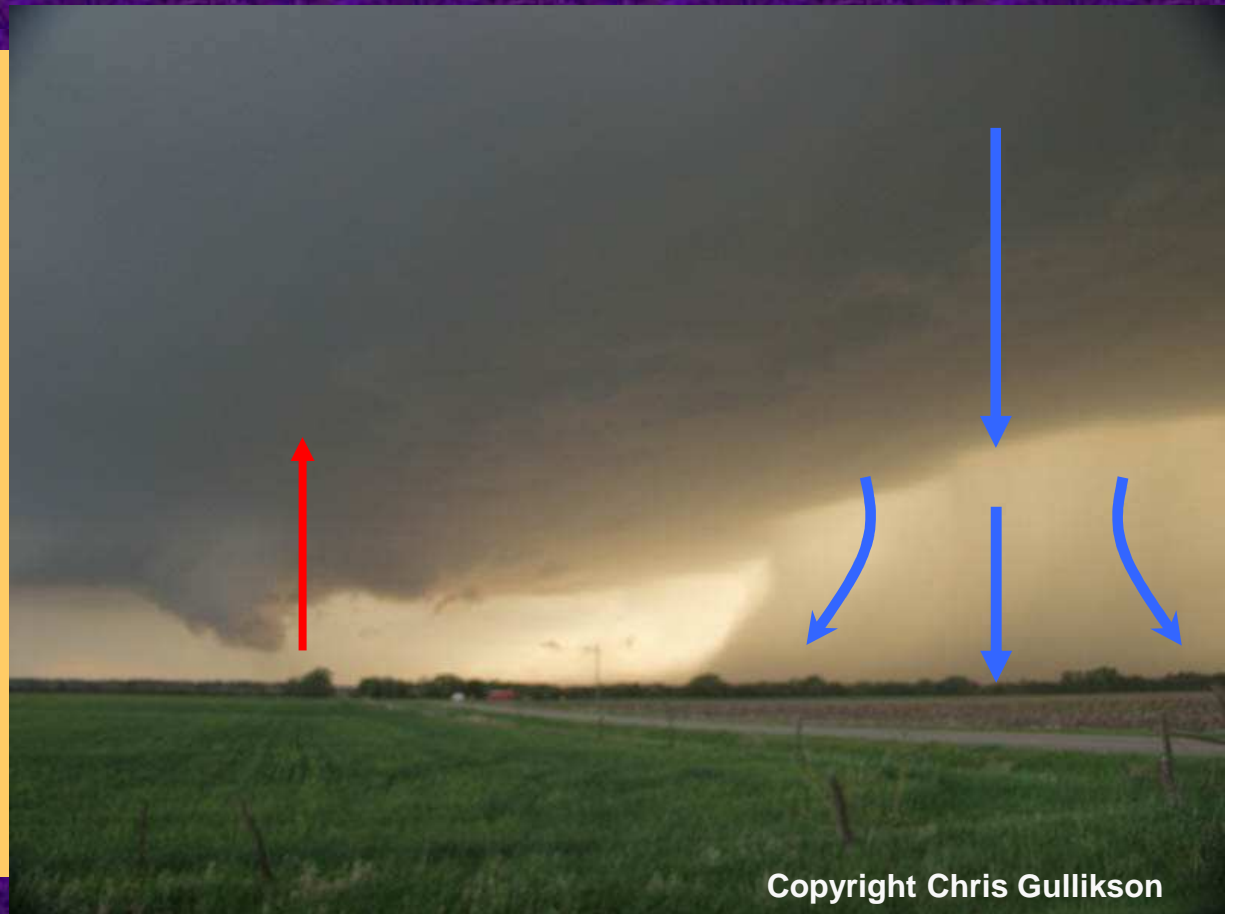
Copyright Dave Chapman

- “Back” side of storm
- Cumulus tower
- Rainfree base
- Upward cloud motion
- Supercell has rotating updraft



# Downdraft Characteristics

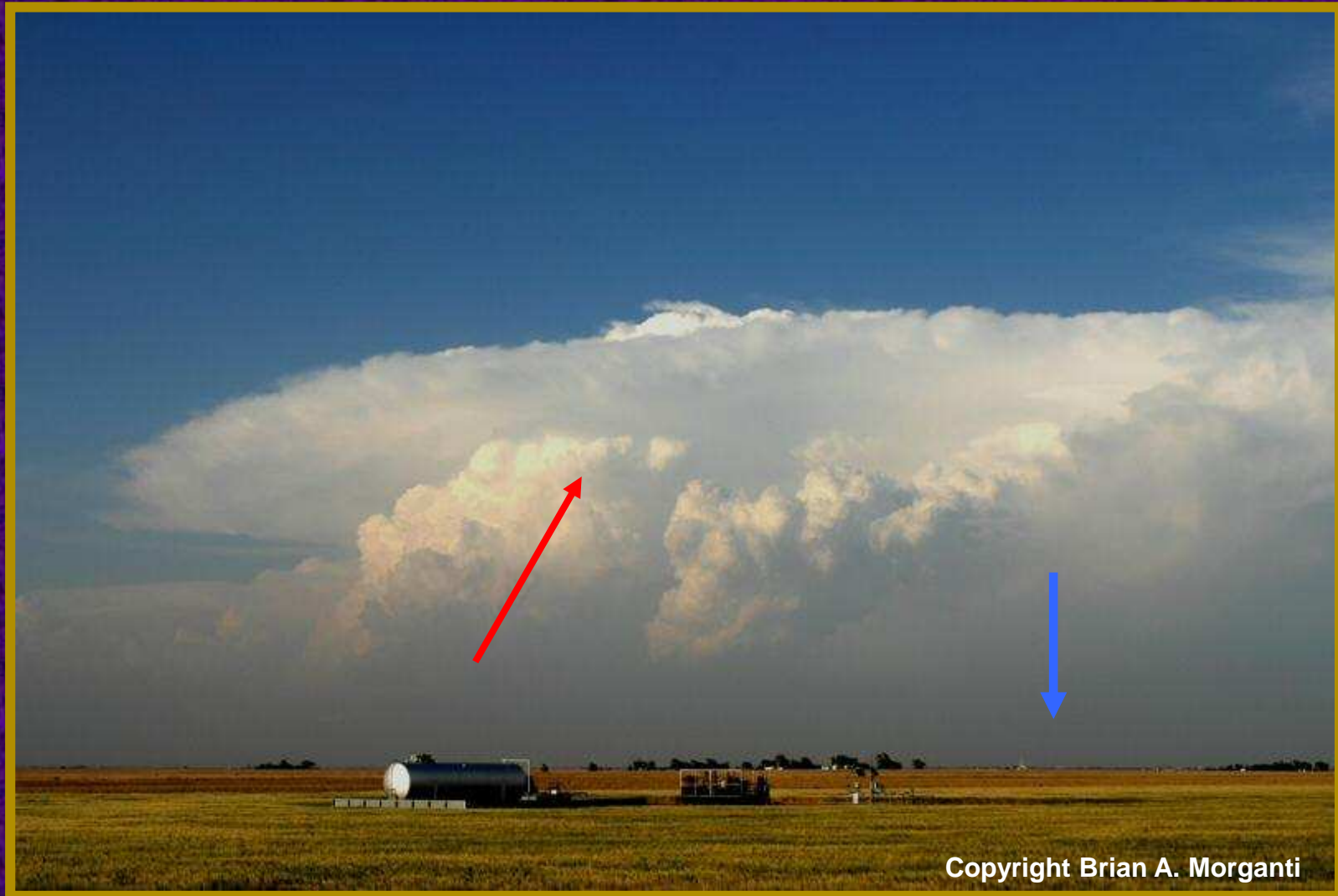
- “Front” side of storm
- Dark area of storm
- Rainfall region
- Downward motion
- Downburst/hail threat



Copyright Chris Gullikson

# Updraft/Downdraft

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Copyright Brian A. Morganti



Copyright Ken Dewey



Courtesy Adrian Pingstone

## Upper Level Storm Strength Clues



07/14/2004

Copyright Robert Heishman





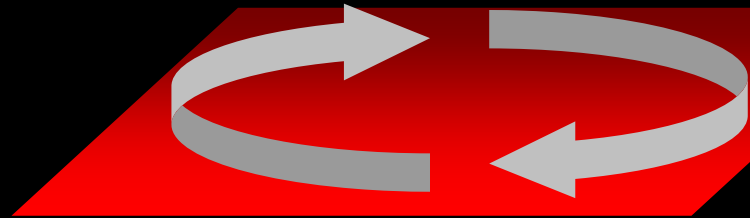
## Mid Level Storm Strength Clues



# Shear vs. Rotation

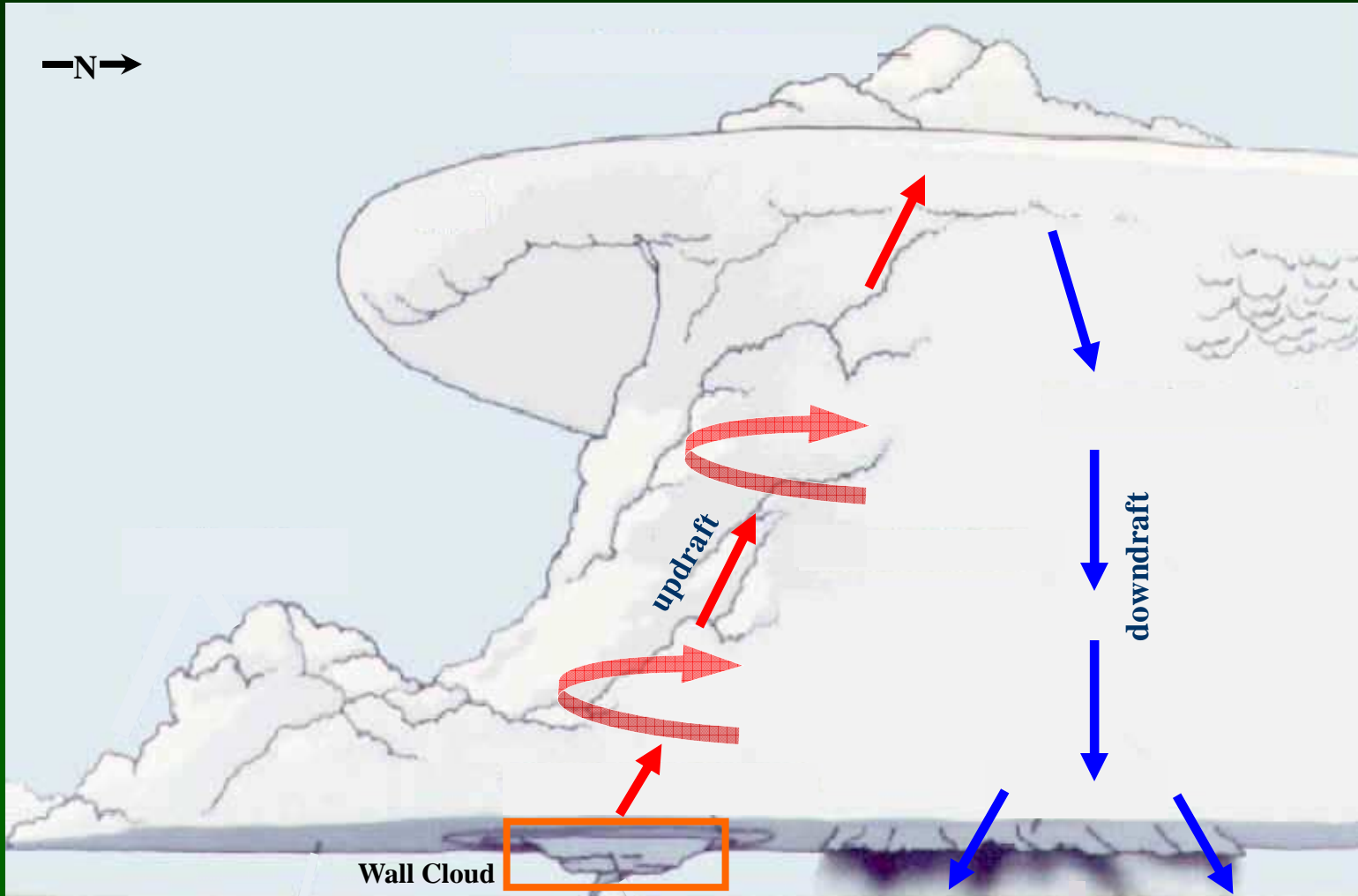


Shear



Rotation

# Wall Clouds





# Wall Cloud Characteristics

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- > Surface based inflow under the updraft
- > Attached to cloud base
- > Look for persistence
- > May or may not rotate
- > Look for vertical cloud motion
- > Often slopes or points toward precipitation or downdraft



Copyright Andy Kula

# Wall Cloud



Copyright Michael D. Peregrine

# Wall Cloud





# Wall Cloud



Copyright Lisa Downing

# Wall Cloud



Copyright Chris Gullikson

# Wall Cloud



Copyright Steve Miller



# Funnel Clouds

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- > A rotating, funnel-shaped cloud extending downward from a thunderstorm base.
- > Usually located near updraft but can be found anywhere
- > Attached to cloud base
- > Exhibit rapid rotation and are most often laminar or smooth in appearance
- > Do not reach ground





© 2004 Jim Bishop & Reed Timmer/Stormgasm.com



Copyright Jeff Piotrowski, Storm Productions, Inc.

# Tornado

A violently rotating column of air extending  
from cloud base to the ground.



Copyright Eric O'Connor



Copyright Reed Timmer, Jim Bishop

# Funnel Cloud



Copyright Paul Craven



# Funnel Cloud



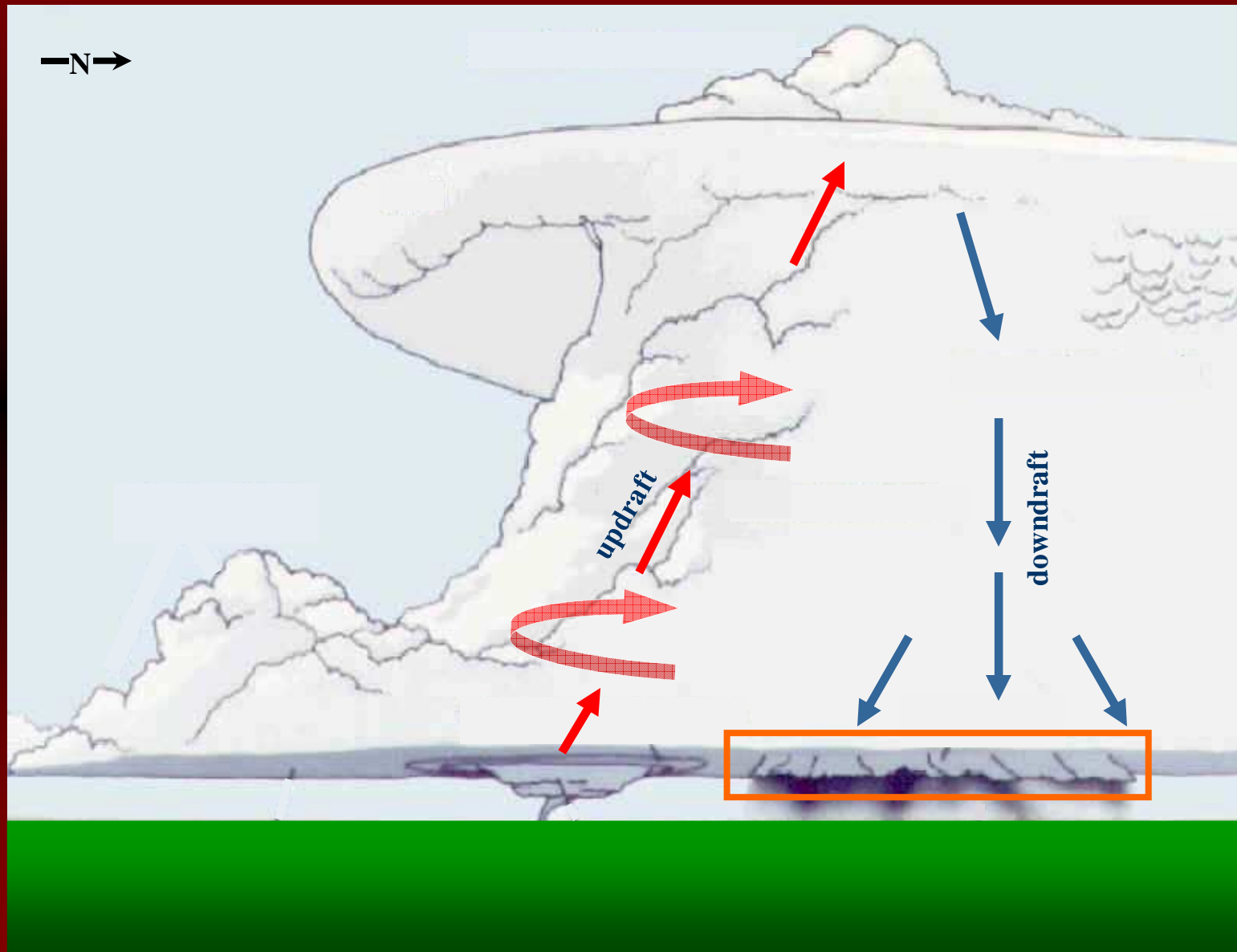
Copyright Jason Parkin KCCI

# Funnel Cloud/Tornado



Copyright Chris Gullikson

# Shelf Clouds





# Shelf Clouds

- Marks the leading edge of the gust front
- Usually produced by rain cooled air
- Usually in area of low level shear
- Slope down away from precipitation area
- Often associated with a squall line- can be associated with gustnadoes or damaging straight-line wind



Copyright Sarah Tessendorf

# Shelf Clouds



Copyright Chris Gullikson

# Shelf Cloud



Courtesy NSSL



# Shelf Cloud



Copyright Jim Bishop

# Rain Foot



# Mammatus



Copyright Jorn Olsen





# Storm Feature Look Alike

Copyright Mike Hollingshead

# Look Alike



Copyright Simon Brewer

# Look Alike



Photo A

Copyright Chris Gullikson



# Look Alike



Copyright Chris Gullikson

Photo B

# Look Alike



# Look Alike



# Look Alike



National Weather Service [www.weather.gov](http://www.weather.gov)



# Look Alike



# Look Alike



# Look Alike



# Look Alike

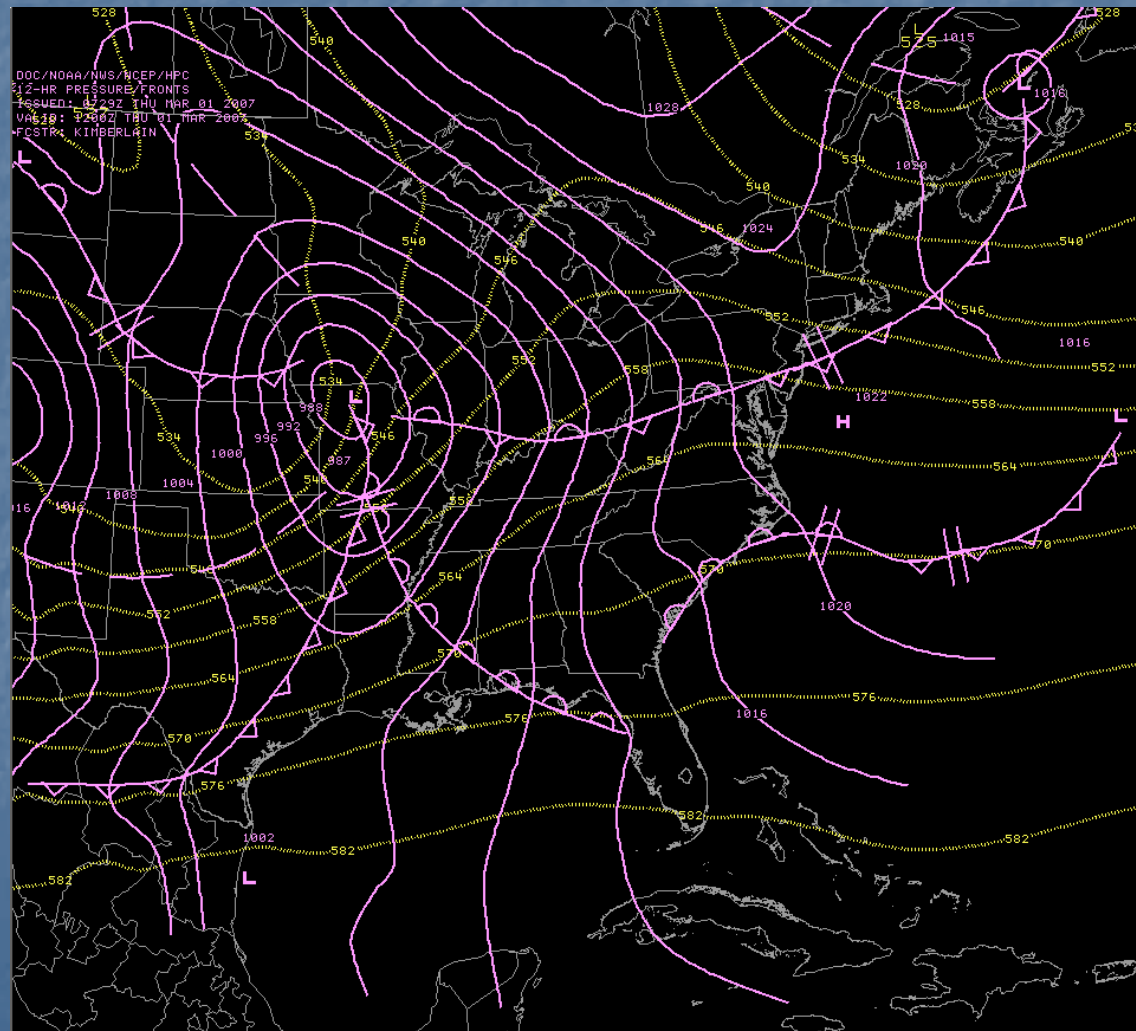




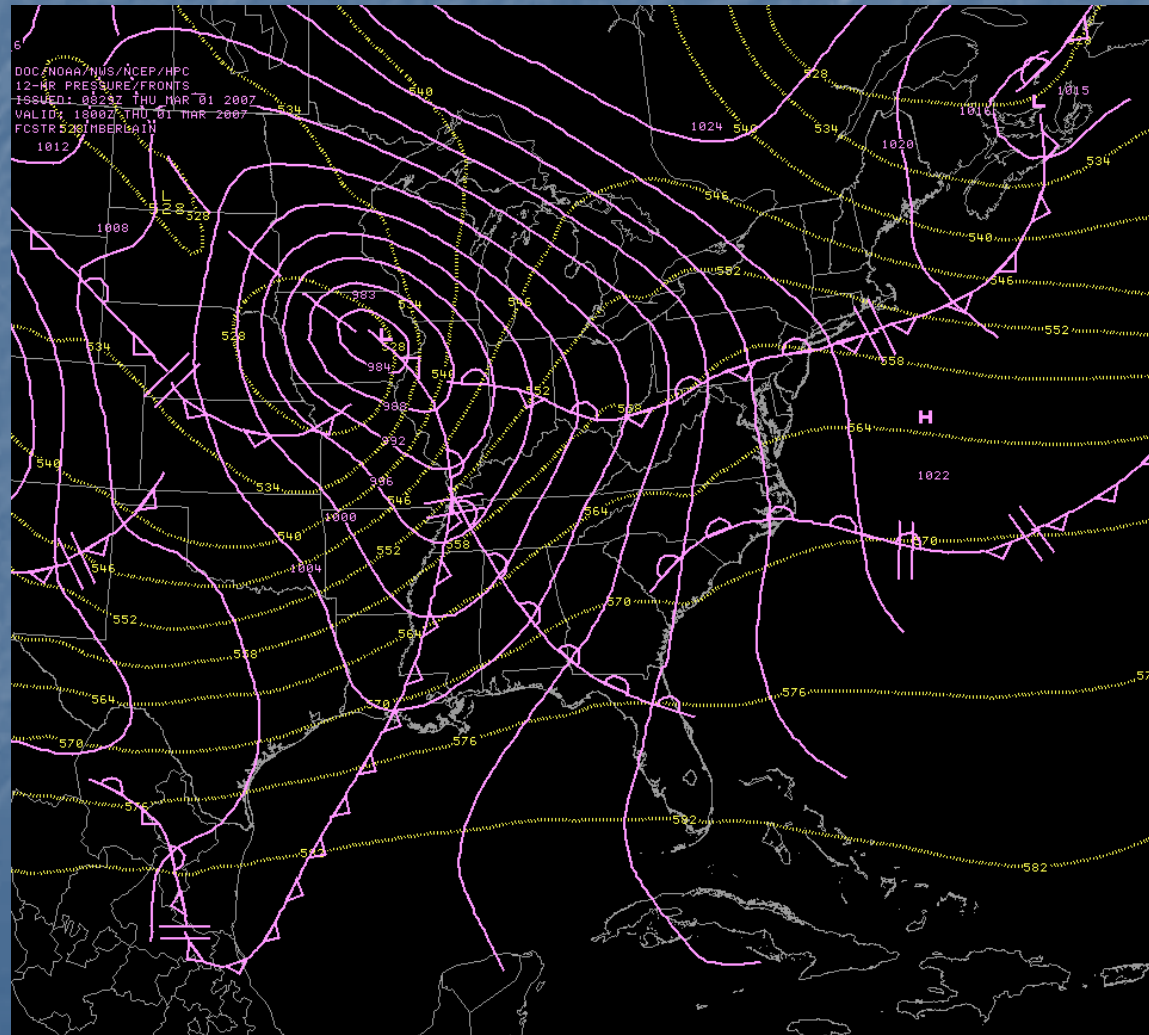
# A Case Study – March 1-2, 2007

- Significant Severe Weather Event
- First High Risk from SPC in our forecast area
- Multiple tornadoes reported
- One EF-4 Tornado hit Enterprise, AL

# 7 am ET, March 1, 2007



# 1 pm ET, March 1, 2007

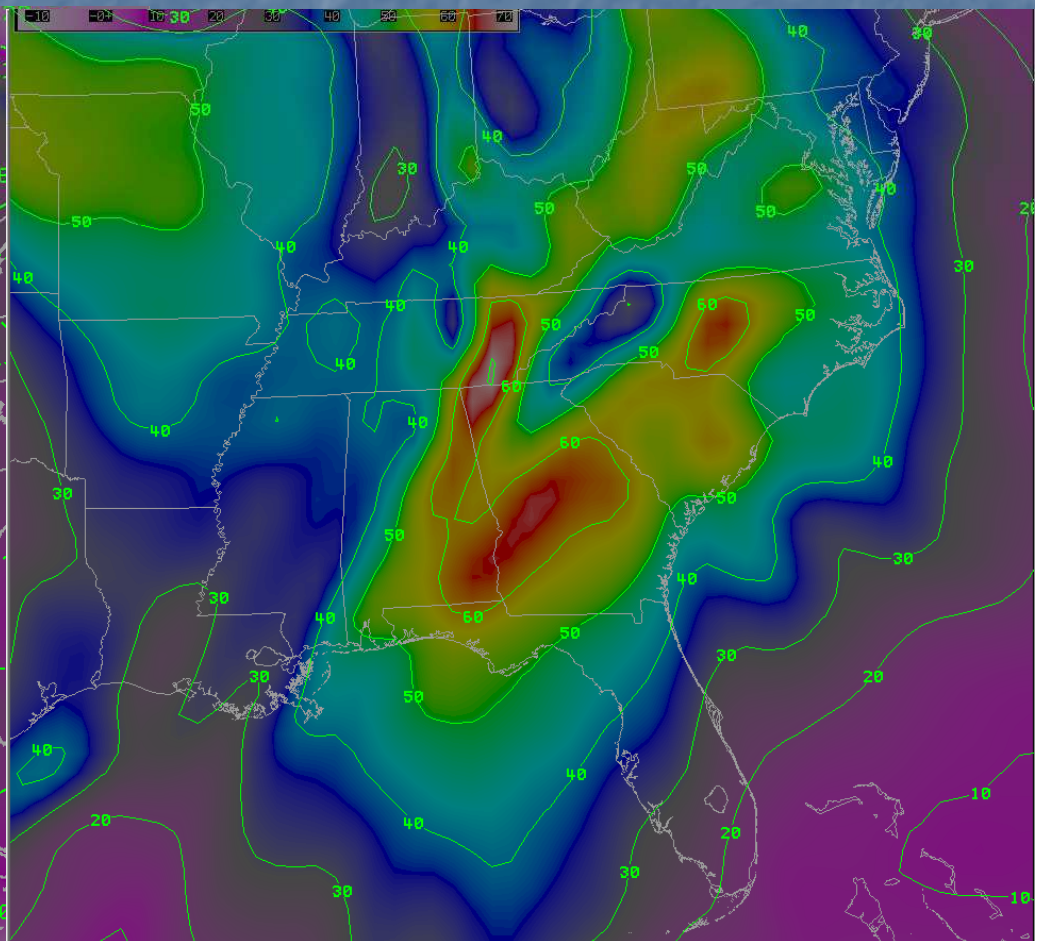
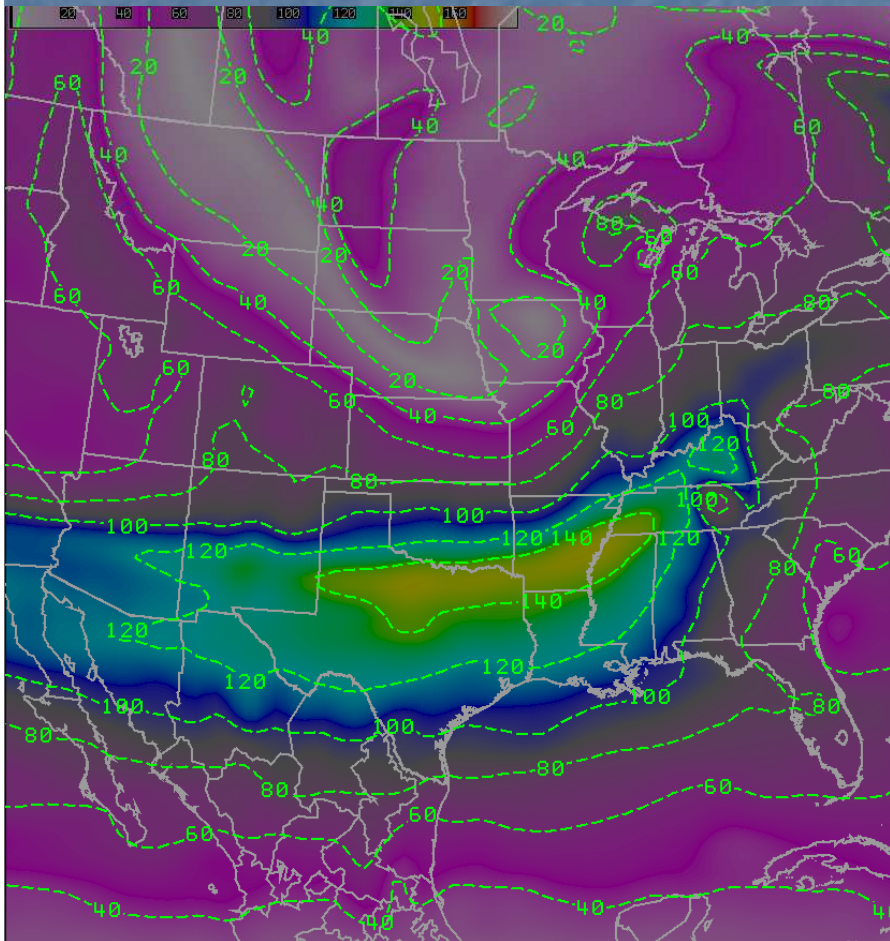




# Jet Structure at Midday

300 MB Jet

850 MB Jet

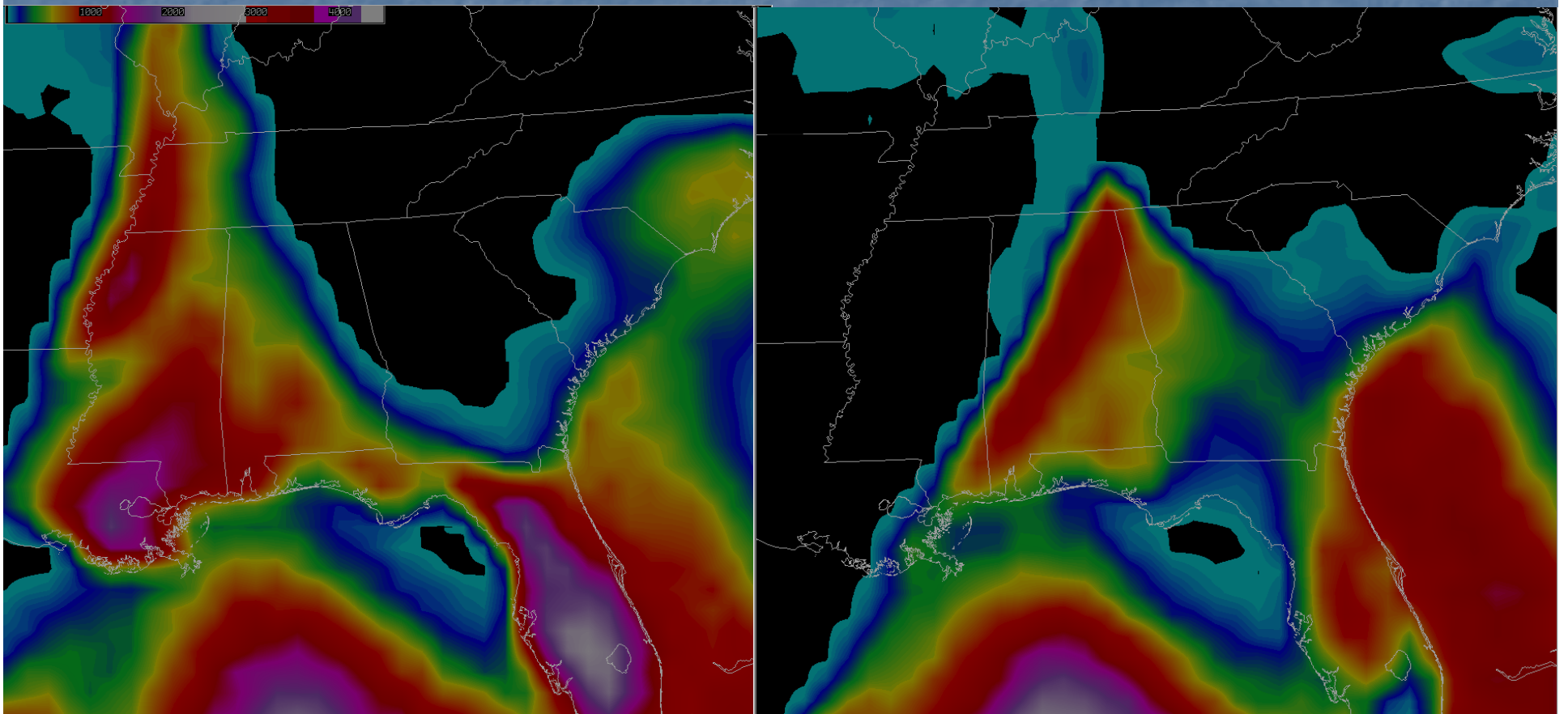




# Instability

1 PM ET

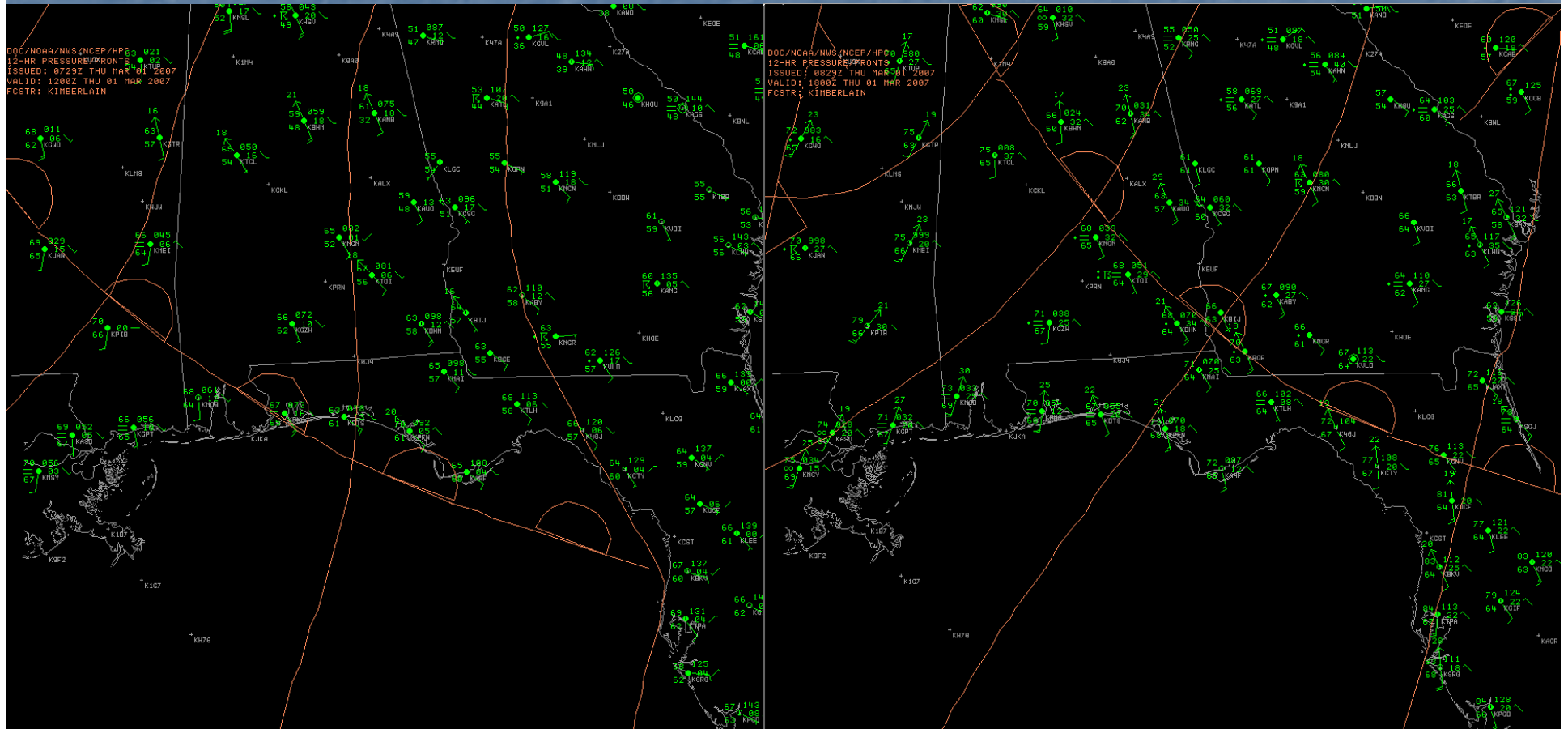
7 PM ET



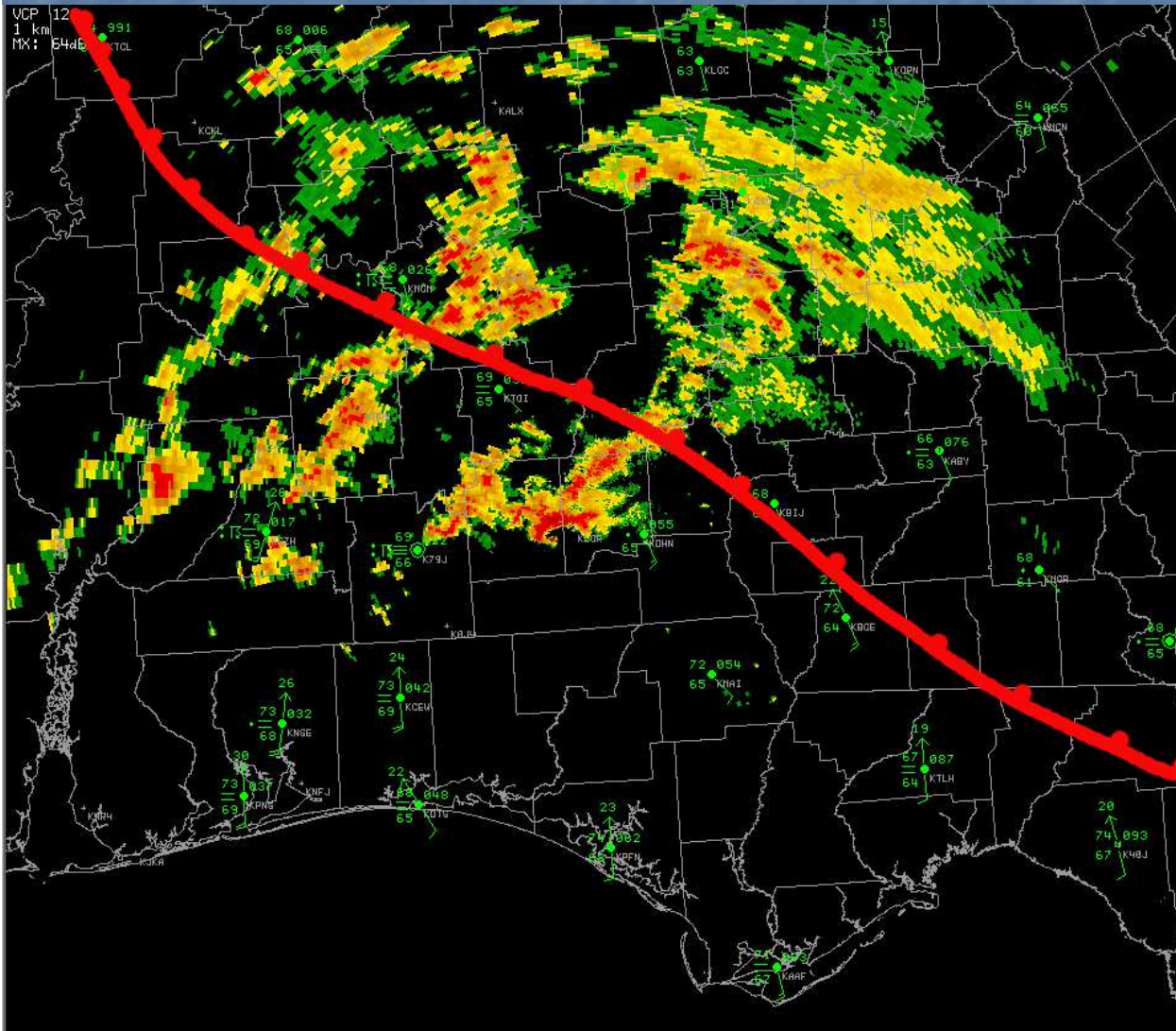
# Enterprise Tornado

7 AM ET

1 PM ET



# Enterprise Tornado



The storm's proximity to the warm front greatly increased the already abundant deep layer shear. Once this storm crossed the warm frontal boundary and moved further into a cooler airmass, the storm weakened considerably. Of course, by the evening, the warm front had lifted further north and the airmass became charged up for part 2



# Tools to use

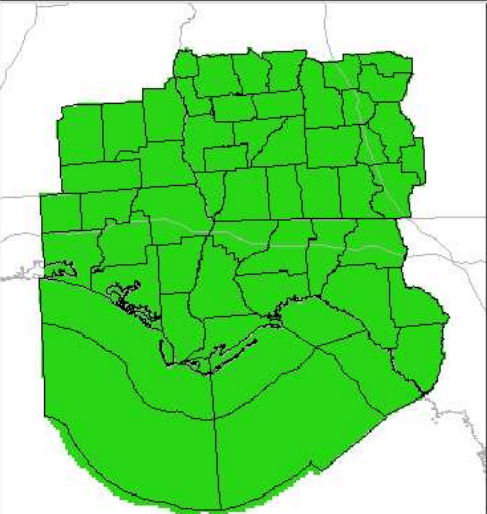
- Our main page: <http://www.srh.noaa.gov/tlh>
- Graphical Hazardous Weather Outlook
- Ridge Radar Display

You are at: NWS Home » SRH Home » WFO Tallahassee Home » Graphical Hazardous Weather Outlook

**Today's Weather Impact Levels** (click on specific hazard for details)

Lightning	Tornado	Prevailing Wind	Hail and/or TS wind	Inland Flood	Coastal Flood	Surf & Rip Currents	Waves	Visibility	Heat/Cold
None	None	None	None	None	None	Low	Slight	None	None

**Lightning Hazard**



Lightning Hazard Tuesday Mar 11

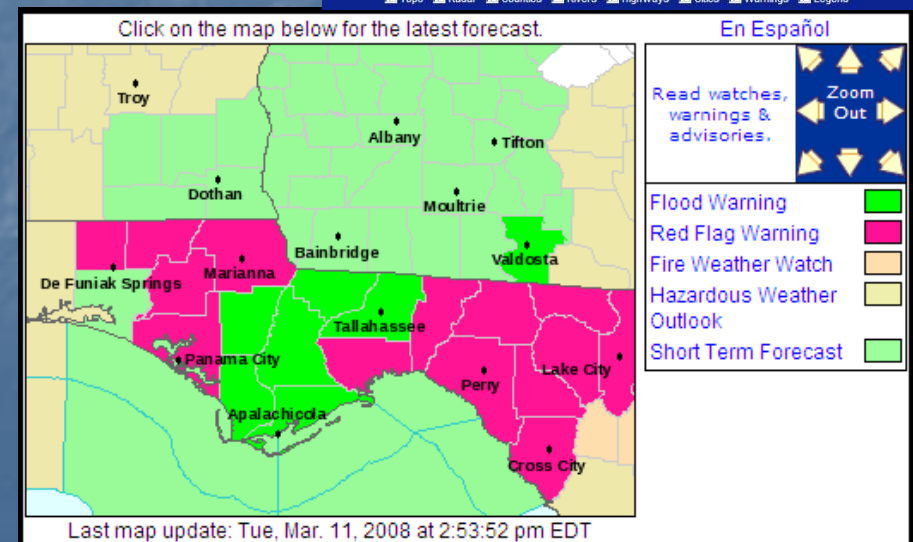
NWS Tallahassee Area

**Legend (Click for Impacts)**

None	No lightning
Slight	Frequency <45 strikes per 15 min (<3 strikes per min)
Moderate	Frequency 45-80 strikes per 15 min (3-6 strikes per min)
High	Frequency 81-120 strikes per 15 min (6-8 strikes per min)
Extreme	Frequency >120 strikes per 15 min (>8 strikes per min)

**Lightning Impact Statement**

For additional hazard information, view the full [Hazardous Weather Outlook](#) text.





# What is the Graphical Hazardous Weather Outlook?

- The Graphical Hazardous Weather Outlook (gHWO) provides a visual depiction of the overall impact posed by a particular weather hazard starting at 6 am and continuing for a 24 hour period ending at 6 am the next day.
- Users can access the gHWO from the NWS Tallahassee main page or directly by this link: <http://www.srh.noaa.gov/tae/ghwo>



National Weather Service Forecast Office  
Tallahassee, FL

www.weather.gov

Local News SRH Home Organization Search Enter Search Here Go

Local weather forecast by "City, St" or zip code  
City, St Go

Current Hazards  
Local  
National

Current Conditions  
Observations  
Florida Weather  
Georgia Weather  
Alabama Weather  
Satellite Images  
Rivers & Lakes AHPS  
Precip Estimate  
Hydrology  
Drought Monitor  
Marine (Buoys)

Radar Imagery  
Local Page  
Tallahassee, FL  
Eglin AFB, FL  
Fort Rucker, AL  
Moody AFB, GA  
Nationwide

Forecasts  
Public Forecasts  
Aviation  
Marine  
Fire Weather  
Local Discussion

Climate  
Local  
National  
More...

Tropical Weather  
N FL Tropics Watch  
Hurricane Center

Weather Safety  
Storm Ready  
SKYWARN  
Preparedness

**Today's Weather Impact Levels** (click on specific hazard for details)

Lightning	Tornado	Wind	Hail	Inland Flood	Coastal Flood	Surf & Rip Currents	Waves	Visibility	Heat/Cold
Moderate	None	Slight	None	Slight	None	Moderate	Moderate	Slight	None

**Lightning Hazard**

Lightning Hazard Friday Sep 07

NWS Tallahassee Area

Legend (Click for Impacts)	
None	No lightning
Slight	Frequency <45 strikes per 15 min (<3 strikes per min)
Moderate	Frequency 45-80 strikes per 15 min (3-6 strikes per min)
High	Frequency 81-120 strikes per 15 min (6-8 strikes per min)
Extreme	Frequency >120 strikes per 15 min (>8 strikes per min)

**Lightning Impact Statement**

For additional hazard information, view the full [Hazardous Weather Outlook](#) text.

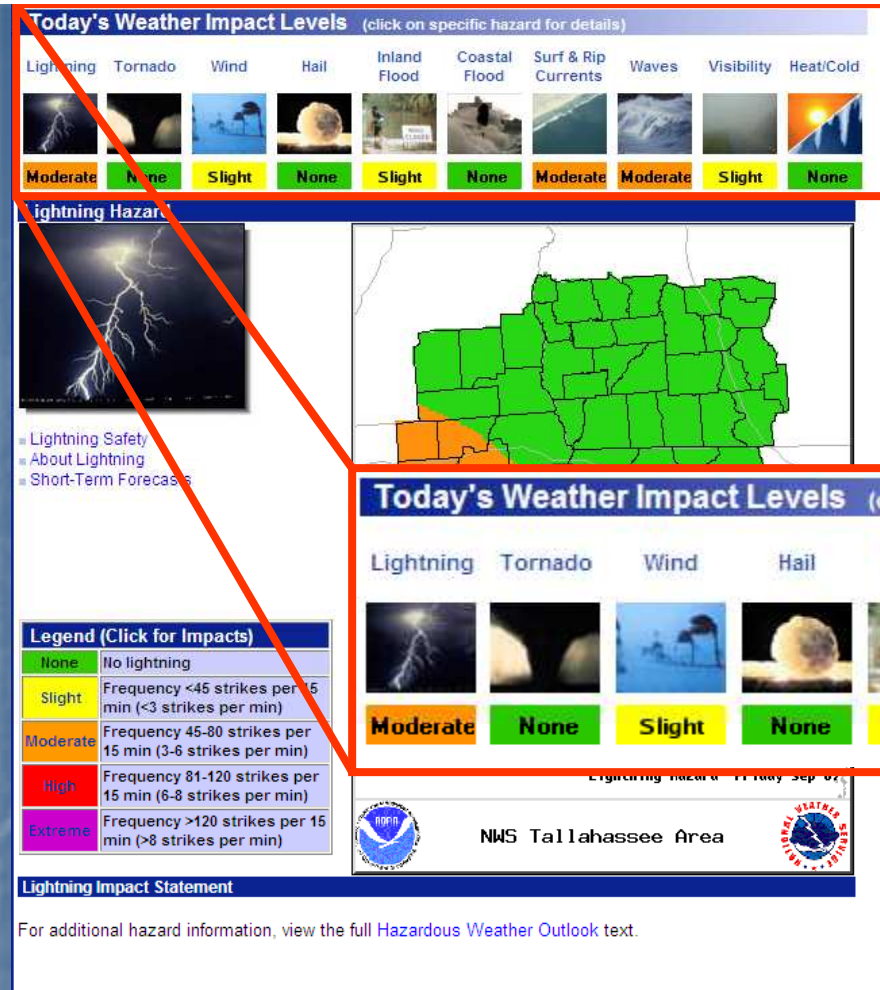
This is the NWS Tallahassee Graphical Hazardous Weather Outlook main page.

This page contains all the information you need to know to quickly determine what hazards are expected for today and their impacts.

Remember, The Graphical Hazardous Weather Outlook only depicts hazards for a 24 hour period.

Over the next couple of slides, we will focus on the three main sections of the gHWO.

# Weather Impact Level Graphic



- Provides a quick snapshot of overall impact presented from each of the 10 hazards.
- Displays the maximum impact level anywhere within the Tallahassee County Warning Area.
- Clicking on each hazard icon will display the individual map for that hazard.



# Tallahassee County Warning Area Hazard Graphic

## Today's Weather Impact Levels (click on specific hazard for details)

Lightning	Tornado	Wind	Hail	Inland Flood	Coastal Flood	Surf & Rip Currents	Waves	Visibility	Heat/Cold
									
Moderate	None	Slight	None	Slight	None	Moderate	Moderate	Slight	None

### Lightning Hazard



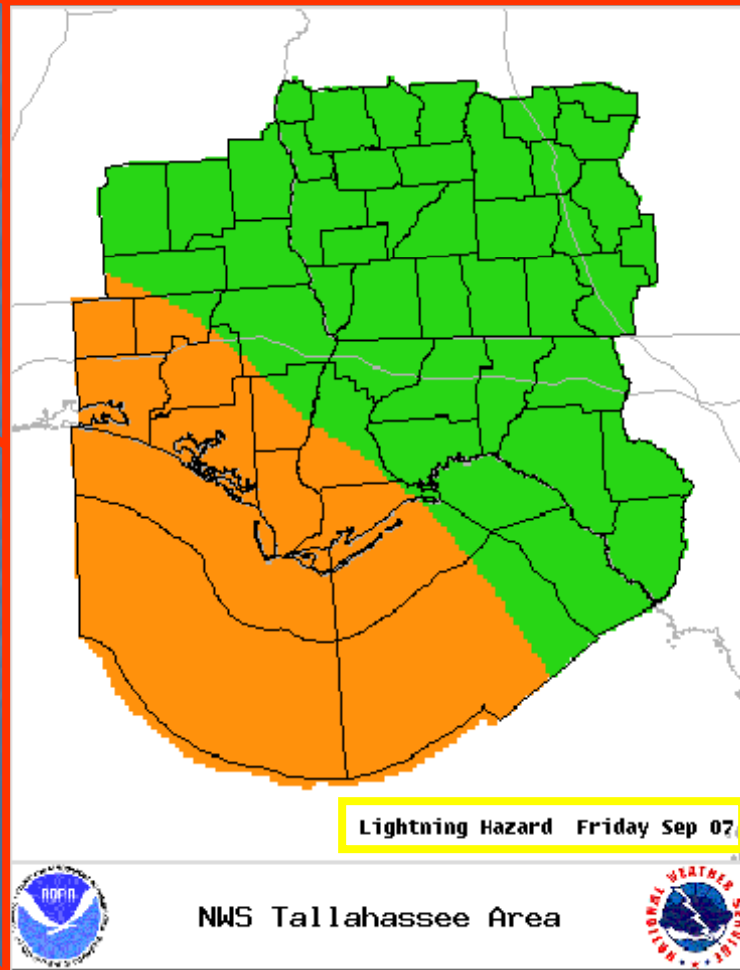
- Lightning Safety
- About Lightning
- Short-Term Forecasts

### Legend (Click for Impacts)

None	No lightning
Slight	Frequency <45 strikes per 15 min (<3 strikes per min)
Moderate	Frequency 45-80 strikes per 15 min (3-6 strikes per min)
High	Frequency 81-120 strikes per 15 min (6-8 strikes per min)
Extreme	Frequency >120 strikes per 15 min (>8 strikes per min)

### Lightning Impact Statement

For additional hazard information, view the full [Hazardous Weather Outlook](#) text.



- Depicts overall impact from each hazard for the entire county warning area.
- Name and date are listed on the graphic (Highlighted in yellow box)

# Hazard Legend and Pop-up descriptions

**Today's Weather Impact Levels** (click on specific hazard for details)

Lightning Tornado Wind Hail Inland Flood Coastal Flood Surf & Rip Currents Waves Visibility Heat/Cold

Moderate None Slight None Slight None Moderate Moderate Slight None

**Lightning Hazard**

Lightning Safety  
About Lightning  
Short-Term Forecasts

**Legend (Click for Impacts)**

None	No lightning
Slight	Frequency <45 strikes per 15 min (<3 strikes per min)
Moderate	Frequency 45-80 strikes per 15 min (3-6 strikes per min)
High	Frequency 81-120 strikes per 15 min (6-8 strikes per min)
Extreme	Frequency >120 strikes per 15 min (>8 strikes per min)

**Lightning Impact: MODERATE**

Frequent cloud to ground lightning is expected. Flash rates will be 46 to 80 strikes per 15 minutes (3 to 6 strikes per minute) for any storm that develops. People outdoors should move indoors upon first incidence of lightning. Indoor safety rules, such as unplugging appliances, should be heeded. [Click for more lightning safety rules.] Isolated lightning-induced fires will be possible.

**Legend (Click for Impacts)**

None	No lightning
Slight	Frequency <45 strikes per 15 min (<3 strikes per min)
Moderate	Frequency 45-80 strikes per 15 min (3-6 strikes per min)
High	Frequency 81-120 strikes per 15 min (6-8 strikes per min)
Extreme	Frequency >120 strikes per 15 min (>8 strikes per min)

**Lightning Impact Statement**

For additional hazard information, view

**Lightning Impact Moderate - Windows Internet Explorer**

http://www.srh.noaa.gov/tae/ghwo/impacts/lightmod.htm

Internet 100%

- Each hazard has a customized legend detailing what each impact level means.
- Additional information can be found by clicking on each impact level. A pop-up window will appear as shown above containing this additional information.



**Today's Weather Impact Levels** (click on specific hazard for details)

Lightning	Tornado	Wind	Hail	Inland Flood	Coastal Flood	Surf & Rip Currents	Waves	Visibility	Heat/Cold
									
Moderate	None	Slight	None	Slight	None	Moderate	Moderate	Slight	None

**Lightning Hazard**



- Lightning Safety
- About Lightning
- Short-Term Forecasts



**Legend (Click for Impacts)**

None	No lightning
Slight	Frequency <45 strikes per 15 min (<3 strikes per min)
Moderate	Frequency 45-80 strikes per 15 min (3-6 strikes per min)
High	Frequency 81-120 strikes per 15 min (6-8 strikes per min)
Extreme	Frequency >120 strikes per 15 min (>8 strikes per min)

**Lightning Impact Statement**

For additional hazard information, view the full [Hazardous Weather Outlook](#) text.

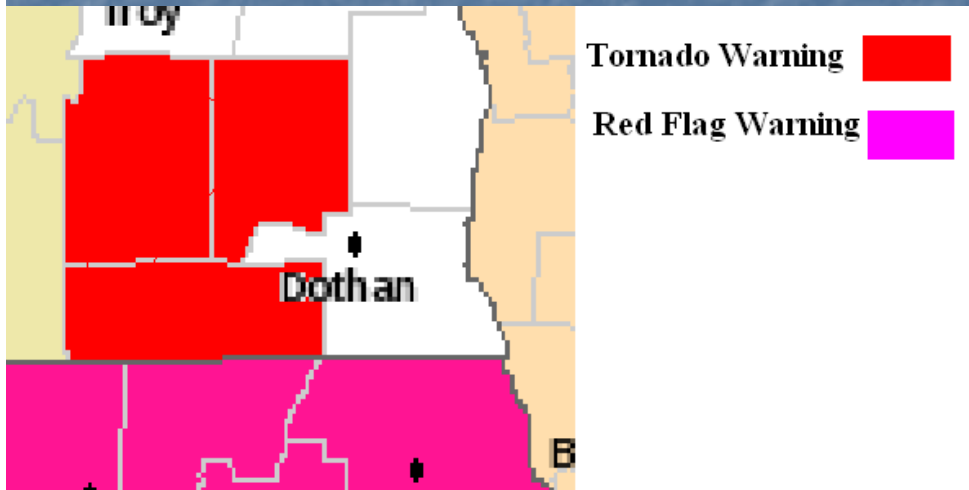
Additional Features of the Graphical Hazardous Weather Outlook

The text version of the HWO can be accessed by clicking on this link.



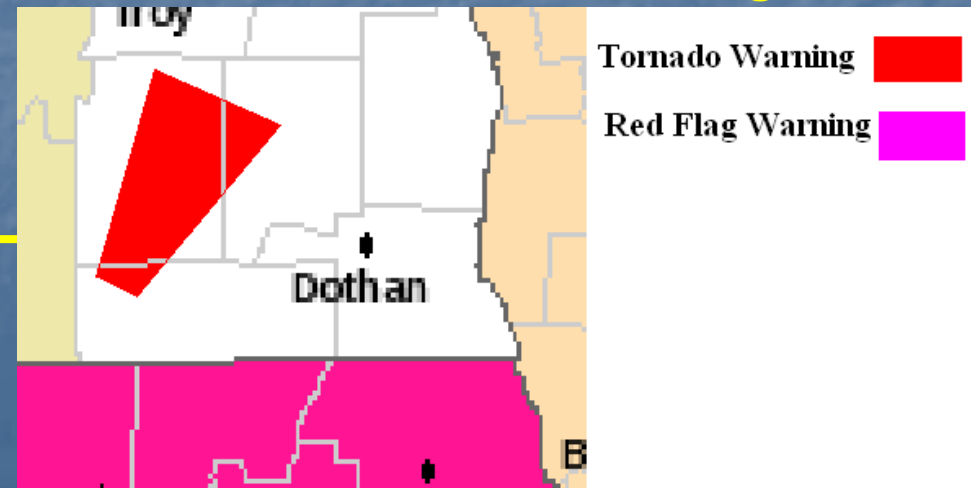
# County Based vs. Storm Based Warnings

## County Based Warnings



County based warnings required warning the entire county when a warning was issued.

## Storm Based Warnings



Now, with storm based warnings, that same warning indicates only which areas of the county are under threat.

# Storm Prediction Center

- Provides daily outlook for organized severe weather.
- Outlooks for Day 1, Day 2, Day 3, and Days 4-8 issued daily
- Threat levels of Slight, Moderate, or High
- <http://www.spc.noaa.gov>

Storm Prediction Center - Windows Internet Explorer

http://www.spc.noaa.gov/

File Edit View Favorites Tools Links Customize Links Free Hotmail Windows Windows Marketplace Windows Media

Storm Prediction Center Home Feeds (3) Print Page Tools Help Research

NOAA's National Weather Service

# Storm Prediction Center

weather.gov

Site Map News Organization Search for:  NCEP All NOAA Go

Local forecast by "City, St" or "ZIP"  
 City, St

Overview  
 SPC Products  
 All SPC Forecasts  
 Current Watches  
 Meso. Discussions  
 Conv. Outlooks  
 Fire Wx Forecasts  
 XML RSS Feeds  
 Weather Information  
 Storm Reports  
 Watch/Warning Map  
 National RADAR  
 Product Archive  
 Norman, OK WX  
 Research  
 Non-op. Products  
 Forecast Tools  
 Svr. Tstm. Events  
 SPC Publications  
 Education & Outreach  
 About the SPC  
 SPC FAQ  
 About Tornadoes  
 About Derechos  
 WCM Page  
 Enh. Fujita Page  
 Cool Images  
 Our History  
 Public Affairs  
 Misc.  
 Staff  
 Links  
 Contact Us  
 SPC Feedback

**Moderate Risk for severe storms...**

- Latest Public Severe Weather Outlook.
- The following Weather Watches are currently in effect:  
0178...0179...0180...0181...
- The following Mesoscale Discussions are currently in effect:  
0606...0607...

More news items below the overview graphic. Updated: Wednesday, 09-Apr-2008 19:10:22 CDT

Overview | Conv. Outlooks | Watches | MDs | WWA | Reports | Mesoanalysis | Fire

SPC DAY1 CONV OUTLOOK  
 ISSUED: 2004Z 04/09/2008  
 VALID: 09/2000Z-10/1200Z  
 FORECASTER: RACY  
 National Weather Service  
 Storm Prediction Center Norman, Oklahoma

Hazard	Wed (04/09)	Thu (04/10)	Fri (04/11)	Sat (04/12)	Sun (04/13)	Mon (04/14)	Tue (04/15)	Wed (04/16)
Severe	Moderate	Moderate	Slight	No Area	No Area	No Area	No Area	No Area
Fire	Extreme	Extreme	Critical	No Area	No Area	No Area	No Area	No Area

Click on the hazard matrix cell to navigate to the specific forecast.

Other News (Updated: April 04, 2008)

National Weather Service • Since 1870

Moving your mouse over these buttons will provide you with a quick view of the daily threat along with the location of any watches or severe weather reports

This summary box gives you an idea of what the maximum threat for severe weather is across the entire country.

Start | Inbox for k... | taechat@c... | MCV writou... | 2 Window... | NWS\_Spott... | The Capitol... | NWSovervi... | Storm Pre... | TAE-W-OPS3 | NWS Web Links | ASOS Metars | 73° | 8:13 PM



# Lightning Safety



Copyright Chris Gullikson

# Lightning Safety

- Lightning strikes the Earth 20 million times per year, on average.
- Most lightning fatalities and injuries occur when people are caught outdoors in the summer months.
- The safest place to remain is indoors and away from windows and electrical appliances
- Avoid being the tallest object, and stay away from other tall objects such as isolated trees.
- If you can hear thunder, you are in danger of being struck by lightning. Take shelter.



Copyright Johnny Autery

# Lightning Myths

Myth: If it is not raining, then there is no danger from lightning.

Truth: Lightning often strikes out of heavy rain and may occur as far as 10 miles away from any rainfall. (Bolt out of the blue.)

Myth: The rubber sole of shoes or rubber tires on a car will protect you from being struck by lightning.

Truth: Rubber-soled shoes or rubber tires on a car provide no protection from lightning. The steel frame of a hard-topped vehicle provides increase protection if you are not touching metal. You are much safer inside an enclosed vehicle than standing outside.

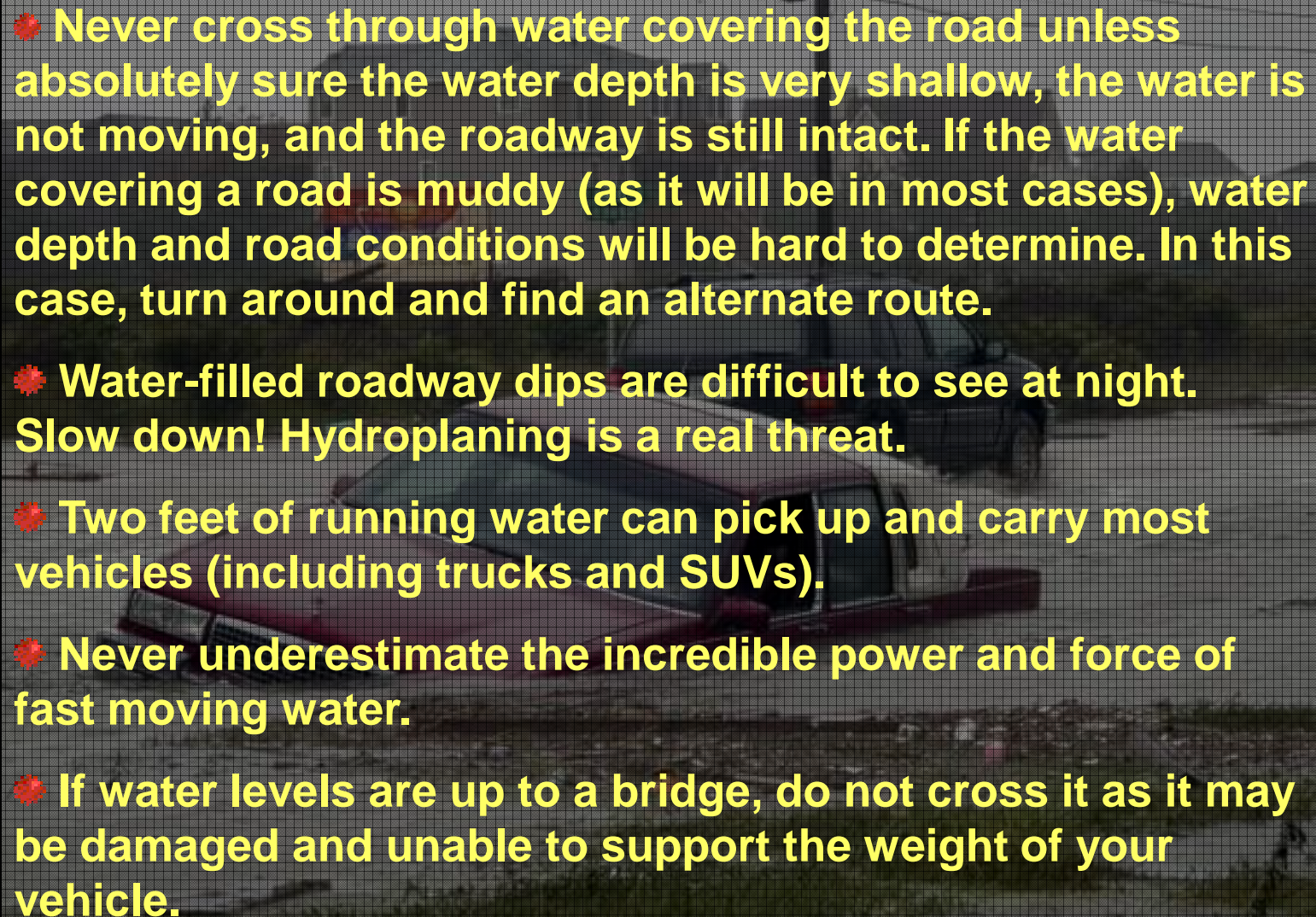


Copyright Johnny Autery



# Flood Safety

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- 
- A photograph of a car driving through floodwaters on a road. The water is murky and appears to be quite deep, reaching up to the car's headlights. The car is a dark color, possibly black or dark blue. The background shows a hazy, overcast sky and some distant trees or hills. The overall scene is one of a dangerous driving condition.
- ❖ **Never cross through water covering the road unless absolutely sure the water depth is very shallow, the water is not moving, and the roadway is still intact. If the water covering a road is muddy (as it will be in most cases), water depth and road conditions will be hard to determine. In this case, turn around and find an alternate route.**
  - ❖ **Water-filled roadway dips are difficult to see at night. Slow down! Hydroplaning is a real threat.**
  - ❖ **Two feet of running water can pick up and carry most vehicles (including trucks and SUVs).**
  - ❖ **Never underestimate the incredible power and force of fast moving water.**
  - ❖ **If water levels are up to a bridge, do not cross it as it may be damaged and unable to support the weight of your vehicle.**



# Flood Safety



**It may just be a whole lot deeper than  
what you think!**

**Remember, boats float, cars don't.**



<http://tadd.weather.gov>

**Don't risk it and become a statistic**

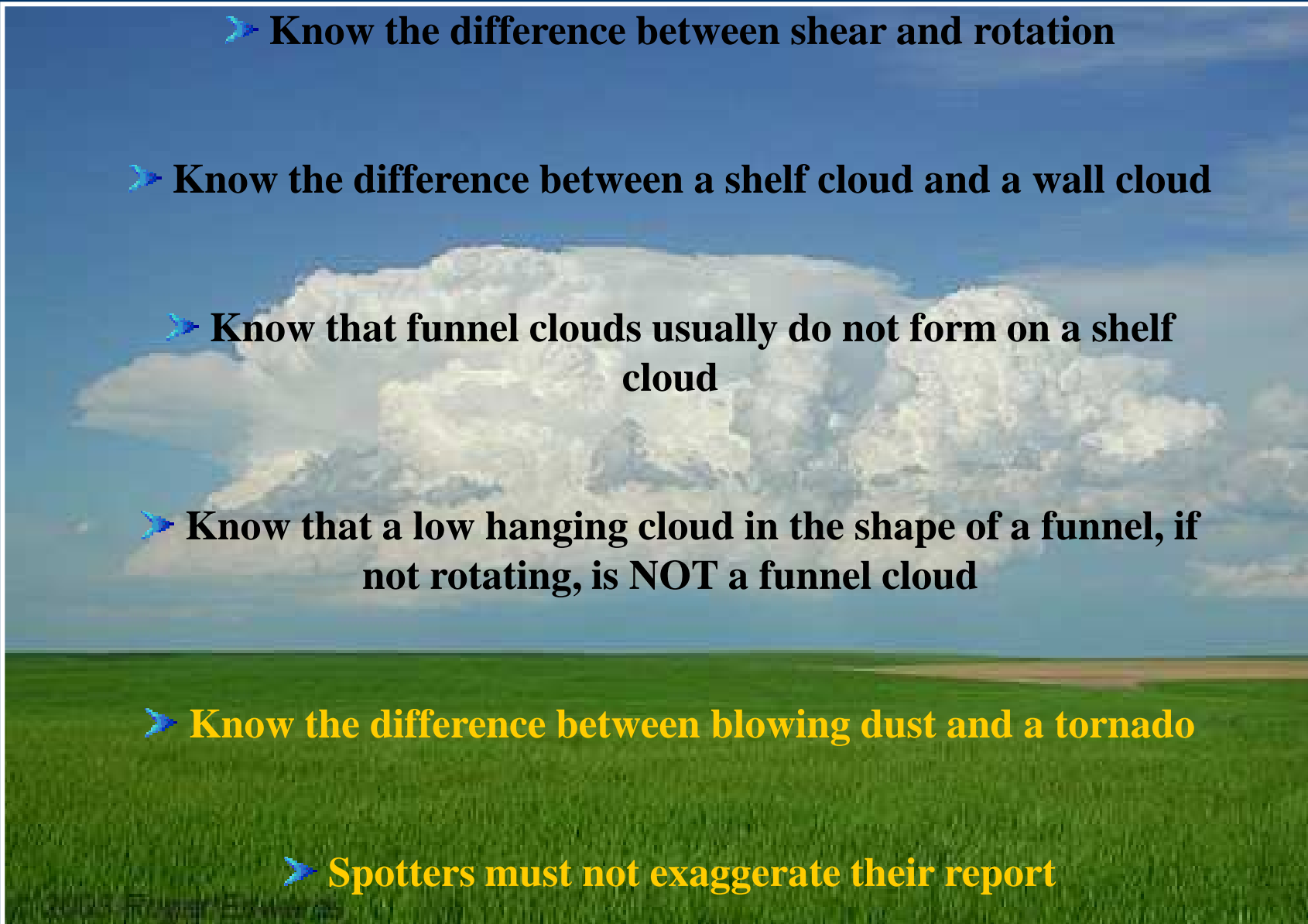


**Story County, IA**



# Spotters Must

- **Know the difference between shear and rotation**
- **Know the difference between a shelf cloud and a wall cloud**
- **Know that funnel clouds usually do not form on a shelf cloud**
- **Know that a low hanging cloud in the shape of a funnel, if not rotating, is NOT a funnel cloud**
- **Know the difference between blowing dust and a tornado**
- **Spotters must not exaggerate their report**



# Myths

● **Myth - I heard a loud noise and it sounded like a train...it had to be a tornado.**

**Truth - Any very strong wind will make a “roaring” noise or sound like a train – the sound depends on the wind speed, local terrain, obstructions to flow, and atmospheric conditions.**

● **Myth - The wind twisted the metal on my shed...the trees that were blown down are twisted...it had to be a tornado.**

**Truth - One generally cannot look at any individual object to determine if the damage was caused by a tornado or straight-line wind. The total damage pattern and how the debris is strewn in relation to other debris is a better indicator of the causative effect. A straight-line wind can cause an object to twist as the destructive force of the wind on an object can cause uneven stress loads with different failure points.**

● **Myth - Objects like lakes, rivers, and hills protect areas from getting hit by a tornado.**

**Truth – Nothing more than folklore. These features provide no protection or have any bearing on the development or movement of a tornado. Some thought tornadoes would not strike the downtown area of a large metropolitan city. Recent tornadoes in downtown Fort Worth, Salt Lake City and Nashville dispelled that myth.**

# Myths

● **Myth – Mobile homes attract tornadoes.**

**Truth – Mobile homes are not more likely to get hit by a tornado. Mobile homes are more likely to sustain damage (compared to a house) if struck by a tornado or strong winds.**

● **Myth – It is safe to seek shelter from a tornado under an overpass.**

**Truth – Overpasses are not a safe place to take shelter. They can funnel the wind flow and increase the strength of the wind. They do not provide protection from flying debris. In addition, parking your car under or near an overpass creates a hazard to other motorists trying to pass through the area. Virtual traffic jams have been created by motorists gathering under an overpass. See this link for [overpass safety](#).**

● **Myth – We should open our windows if a tornado approaches.**

**Truth – Stay away from windows if a tornado approaches. If your windows are closed, leave them closed. Your house will not explode due to the decrease in pressure within the tornado. If the tornado is close enough to your house that it experiences a significant and rapid drop in pressure, chances are the wind and debris will have damaged or destroyed your house before the minimum drop in pressure occurred.**



# We want your storm photos!!



If you have any storm photos or videos that you would like to share with us, please e-mail them to your local NWS. Include your name, date of the photo, where the photo was taken, and a description of the photo. Also indicate if you give the NWS permission to use the photo.

We are interested in ALL weather phenomenon and cloud types. The best photos or videos are those taken which show a wide view of thunderstorm structure. Close-ups are good, but they do not allow others to take in the bigger picture (no pun intended). It is this wider perspective that allows others to learn by seeing the structure of a specific phenomenon relative to that of the entire thunderstorm.

# The End



Questions? Comments?

Kelly.Godsey@noaa.gov

**Thank you for attending our spotter class!**

**If you would like to expand upon your experience, please consider taking the online spotter test. After completing the test, a certificate of completion will be available**

**[http://www.srh.noaa.gov/tae/spotter/spotter\\_test](http://www.srh.noaa.gov/tae/spotter/spotter_test)**